



**TENSAI**  
INTERNATIONAL

# **SERVICE MANUAL**

**TA-2650**

**TI-2600**

**TI-2610**

**TT-3645**

**TFL-812**

## TABLE OF CONTENTS

1. TA 2650 [Stereo Integrated Amplifier]	
1-1 SPECIFICATIONS .....	3
1-2 ALIGNMENT .....	3
1-3 WIRING VIEW .....	4
1-4 SCHEMATIC DIAGRAM .....	5&6
1-5 EXPLODED VIEW .....	7
1-6 PRINTED CIRCUIT BOARDS .....	8&9
1-7 PARTS LIST .....	10&11
2. TI 2600 [Remote Control Receiver with Built in timer]	
2-1 SPECIFICATIONS .....	12
2-2 ALIGNMENT .....	12
2-3 SCHEMATIC DIAGRAM .....	13&14
2-4 WIRING VIEW .....	15
2-5 EXPLODED VIEW .....	16
2-6 PRINTED CIRCUIT BOARDS .....	17&18
2-7 PARTS LIST .....	18&19
3. TI 2610 [Remote Control Transmitter]	
3-1 EXPLODED VIEW .....	20
3-2 SCHEMATIC DIAGRAM .....	21&22
3-3 PRINTED CIRCUIT BOARDS .....	23
3-4 PARTS LIST .....	23
4. TT 3345 [Stereo Tuner]	
4-1 SPECIFICATIONS .....	24
4-2 ALIGNMENT .....	24
4-3 SCHEMATIC DIAGRAM .....	25&26
4-4 WIRING VIEW .....	27
4-5 EXPLODED VIEW .....	28
4-6 PRINTED CIRCUIT BOARDS .....	29&30
4-7 PARTS LIST .....	31&32
5. TFL 812 [Cassette Deck]	
5-1 SPECIFICATIONS .....	33
5-2 ALIGNMENT .....	33
5-3 WIRING VIEW .....	34
5-4 SCHEMATIC DIAGRAM .....	35&36
5-5 EXPLODED VIEW .....	37
5-6 MECHANISM EXPLODED VIEW .....	38
5-7 PRINTED CIRCUIT BOARDS .....	39&40
5-8 PARTS LIST .....	41to43

## 1-1 SPECIFICATIONS

Rated Output Power	
50 W continuous per channel, at 8 ohms from 20 to 20,000 Hz with no more than 0.1 % THD, both channels driven.	
Total Harmonic Distortion	
0.1 % at rated power	
0.05 % at 1W/1 kHz	
Input Sensitivity/Impedance	
Phono :	2.5 mV/47 k ohms
Tuner :	150 mV/47 k ohms
Aux :	150 mV/47 k ohms
Tape:	150 mV/47 k ohms
Phono Maximum Input Level	200 mV
Output Level/Impedance	
TAPE:	150 mV/47 k ohms
Headphones :	8 ohms
Speakers :	A, B, A + B, OFF/8 ohms or more
Frequency Response	20-20,000 Hz +0/-1 dB
Tone Control Bass :	±9 dB/100 Hz
Treble :	±9 dB/10 kHz
Loudness Control	+8 dB/100 Hz, +4 dB/10 kHz
Subsonic Filter	-6 dB/15 Hz
Hi Filter	-6 dB/10 kHz
Signal - to - Noise Ratio	
Phono :	75 dB
Tuner, Aux, Tape :	85 dB
Power Consumption :	250W at rated power output
	28 W at no signal
Dimensions (WHD) :	430 × 80 × 250 mm
Weight :	6.5 kg

Our policy is one of continuous development of our products and we may change specifications without notice.

## 1-2 ALIGNMENT

## TA-2650 PRE-MAIN AMPLIFIER ALIGNMENT PROCEDURES

## A) OFF-SET VOLTAGE ALIGNMENT

1. Set a volume control at minimum position and also set tone controls (bass/treble) at centre positions.
2. Connect a speaker terminal + to the DC voltage meter + . Also connect a speaker terminal - to the DC voltage meter - .
3. Check the DC voltage to be at under plus/minus 50 mV.
4. When L channel is over +50 mV, cut a ADJ 1 jumper.  
When L channel is over -50 mV, cut a ADJ 2 jumper.  
When R channel is over +50 mV, cut a ADJ 3 jumper.  
When R channel is over -50 mV, cut a ADJ 4 jumper.

## B) IDLING CURRENT CHECK

1. Set a volume control at minimum position and also set tone controls (bass/treble) at centre positions.
2. Connect TP1 of L channel to the DC voltage meter + .  
Connect TP2 of L channel to the DC voltage meter - .  
Connect TP4 of R channel to the DC voltage meter + .  
Connect TP3 of R channel to the DC voltage meter - .  
Then, check if DC voltage meter is at under 7 mV.
3. In case of over 7 mV, cut ADJ 5 jumper of L channel and also cut ADJ 6 jumper of R channel.

## C) PROTECTION CIRCUIT ALIGNMENT

1. Check a protection relay to be cut off by giving plus/minus 2V to TP5 through centre voltage (output 0.6V).
2. Check a protection relay to be cut off by shorting speaker terminals + and - through giving over current (output 3V).

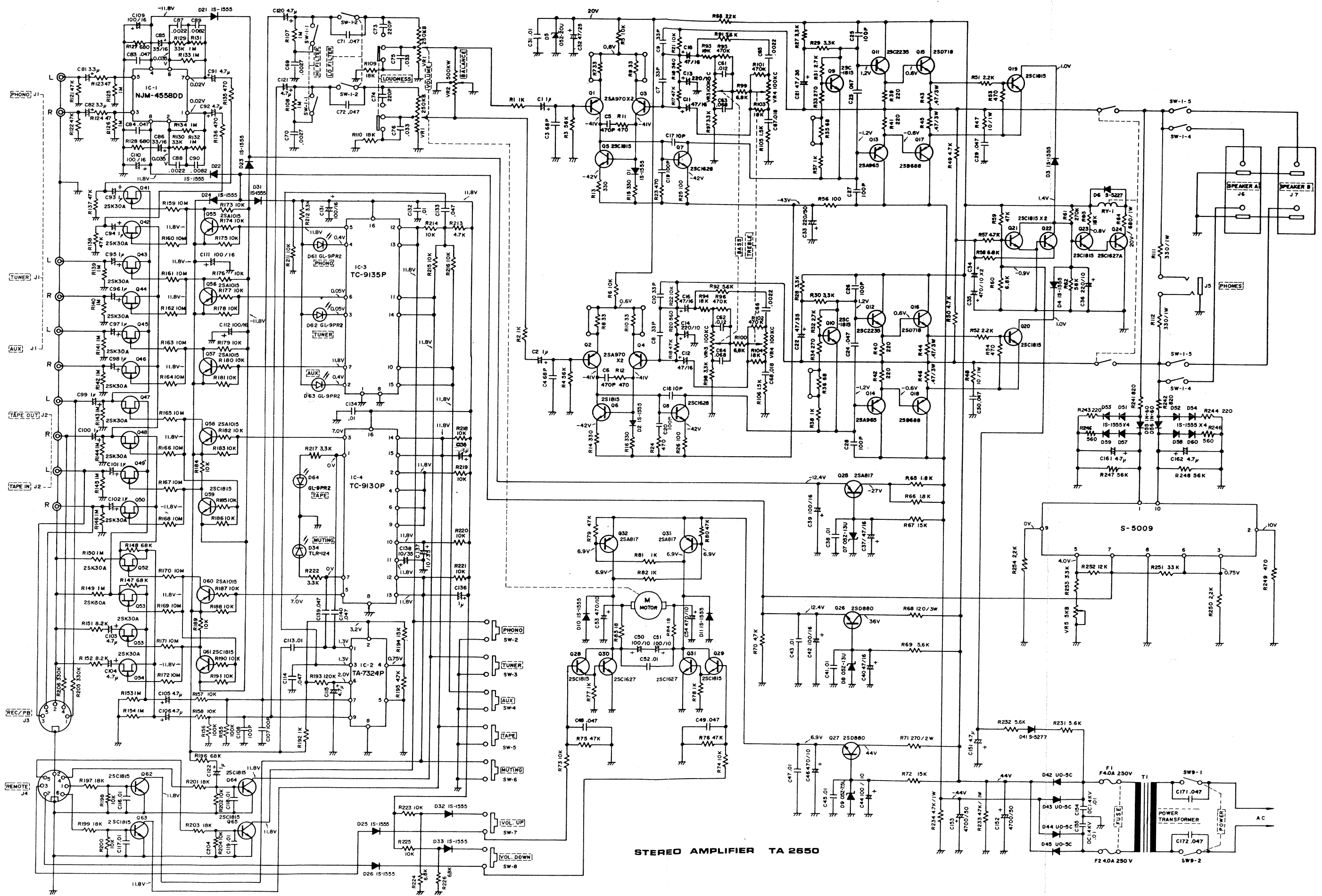
## D) LEVEL INDICATOR ALIGNMENT (output load 8 ohm)

1. Give 1 KHZ signal to left and right channels through oscillator and set the output voltage at 17.9V.  
This time, turn up VR5 semi-fixed resistor to the right direction and confirm all LEDs light up.
2. Turn VR5 semi-fixed resistor to the left direction and stop turning when the right side LED (50W) goes out.





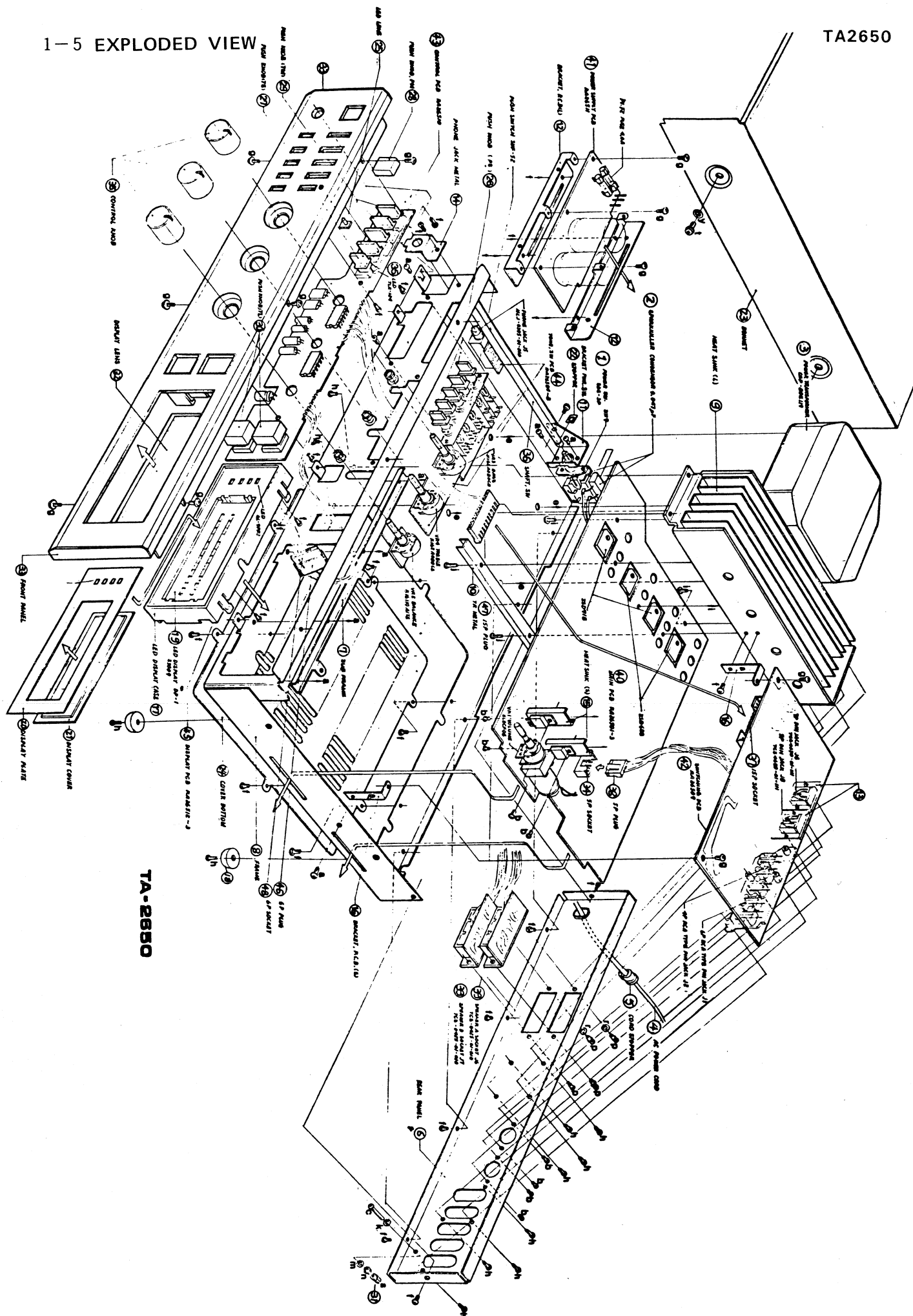
## 1-4 SCHEMATIC DIAGRAM



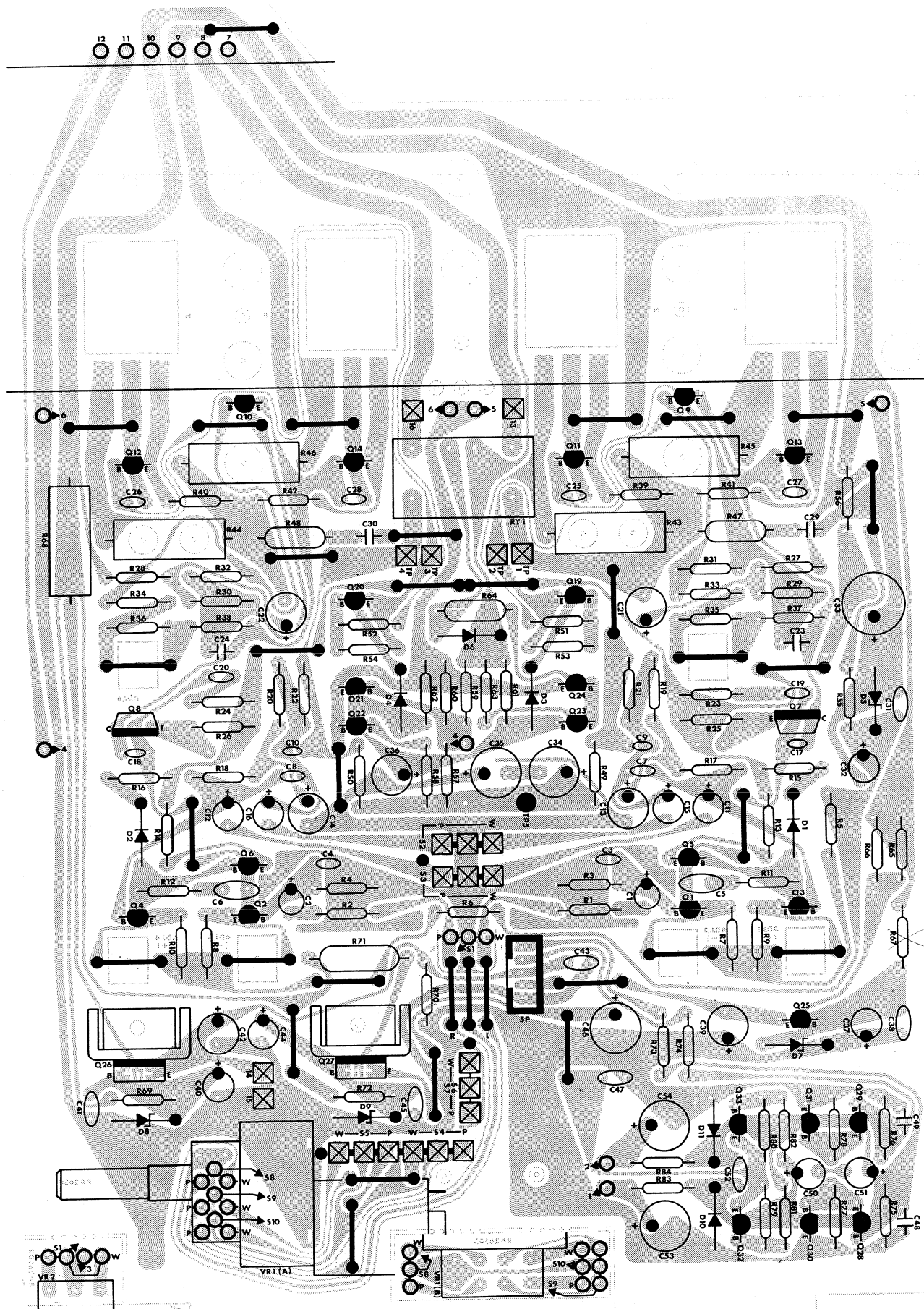
STEREO AMPLIFIER TA 2650

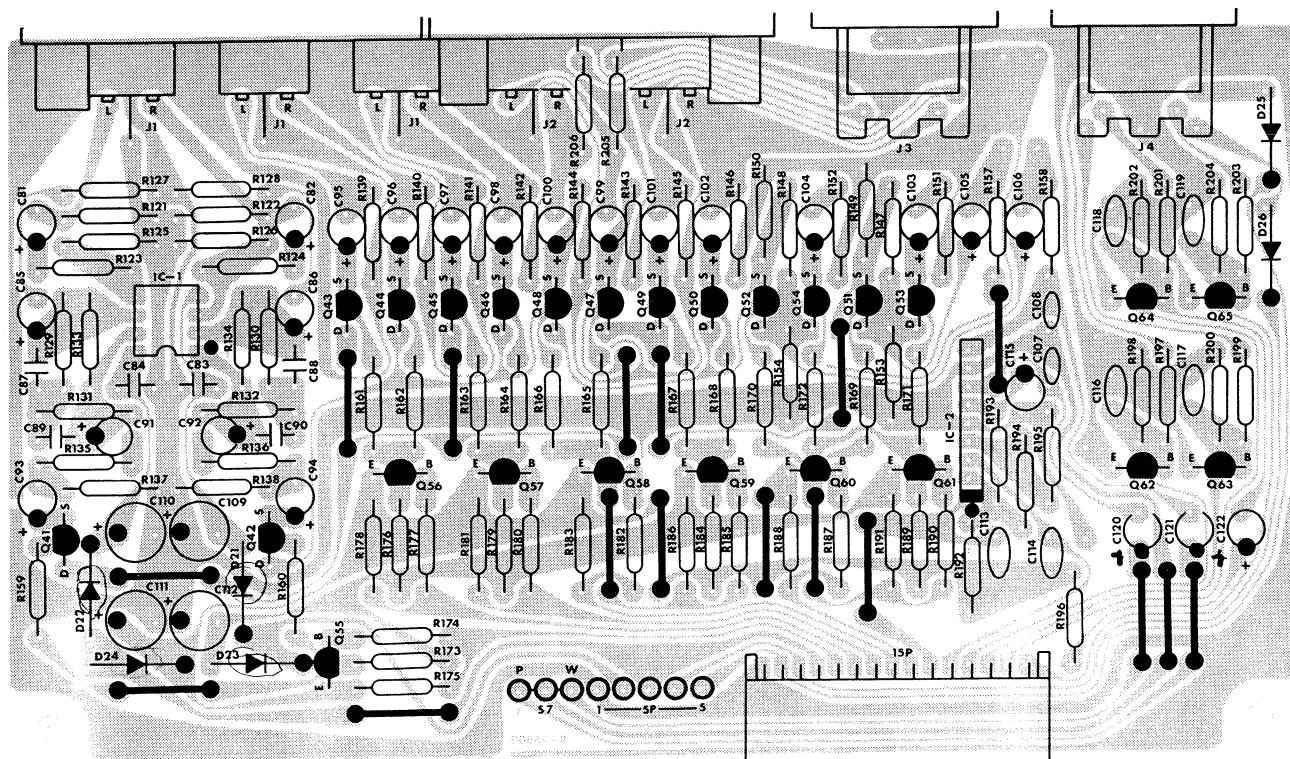
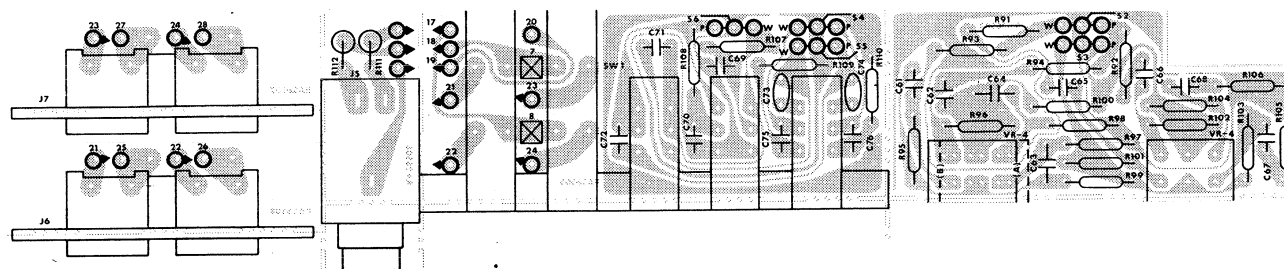
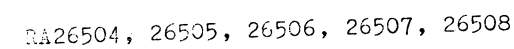
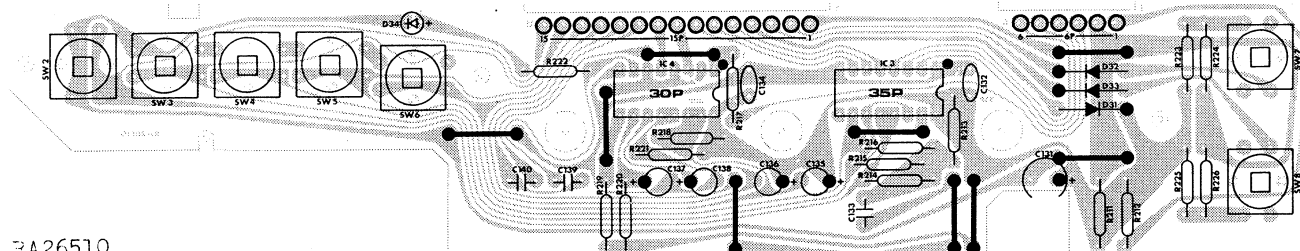
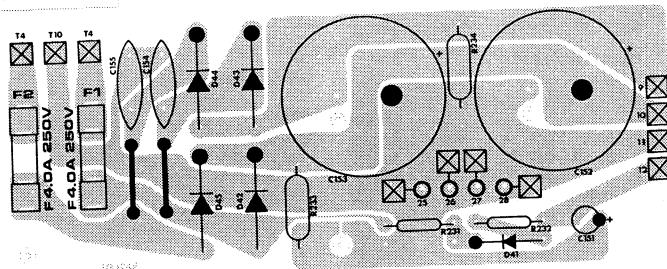
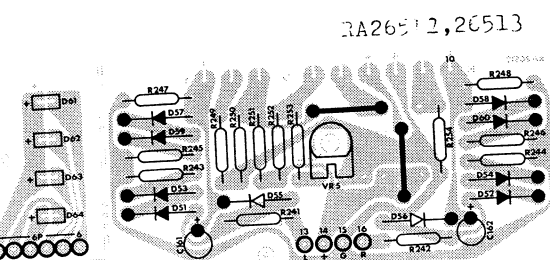
# 1-5 EXPLODED VIEW

TA2650



TA-2650







## 1-7 PARTS LIST

TA2650

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
MAIN PCB SECTION							
265014		PCB RA-26501-3	1	265106	R233, 234	RESISTOR 4.7K $\Omega$ 1W	2
TRANSISTORS				265107	R232	RESISTOR S-25PL 4.7K $\Omega$	1
265001	Q15, 16	TR. 2SD-718 (O, Y)	2	265108	R231	RESISTOR S-25PL 5.6K $\Omega$	1
265002	Q17, 18	TR. 2SB-688 (O, Y)	2	265149	F1, 2	FUSE F4.0A	2
265003	Q11, 12	TR. 2SC-235 (O, Y)	2	265150		FUSE HOLDER 5 $\phi$	4
265004	Q13, 14	TR. 2SA-965 (O, Y)	2	265156		JUMPER LEAD 12.5 m/m	2
265005	Q7, 8	TR. 2SC-1628 (O, Y)	2	265153		LAPPING PIN	11
265006	Q1, 2, 3, 4	TR. 2SA-970 (GR, BL)	4	CONTROL PCB SECTION			
265007	Q5, 6, 9, 10, 19, 20, 21, 23, 28, 29	TR. 2SC-1815 (O, Y)	11	265017		PCB RA-26510	1
265008	Q24	TR. 2SC-1627A (O, Y)	1	265161	IC4	IC TC-9130P	1
265009	Q25, 32, 33	TR. 2SA-817 (O, Y)	3	265162	IC3	IC TC-9135P	1
265010	Q30, 31	TR. 2SC-1627 (O, Y)	2	265024	D31, 32, 33	DIODE 1S-1555	3
265011	Q26, 27	TR. 2SD-880 (O, Y)	2	265163	D34	LED TLR-124	1
DIODES				265037	C131	ELECT. CAPACITOR 100 $\mu$ F 16V	1
265023	D6	DIODE S-5277	1	265046	C137, 138	ELECT. CAPACITOR 10 $\mu$ F 35V	2
265024	D1, 2, 3, 4, 10, 11	DIODE 1S-1555	6	265042	C135, 136	ELECT. CAPACITOR 1 $\mu$ F 50V	2
265031	D5	ZENOR DIODE 05Z-20U	1	265056	C133, 139, 140	MYLAR CAPACITOR 0.047 $\mu$ F	3
265032	D7, 8	ZENOR DIODE 05Z-13U	2	265074	C132, 134	CERAMIC CAPACITOR 0.01 $\mu$ F	2
265033	D9	ZENOR DIODE 05Z-7.5L	1	265109	R211, 214, 215, 216, 218, 219, 220, 221, 223, 225	RESISTOR S-25PL 10K $\Omega$	10
CAPACITORS				265110	R224, 226	RESISTOR S-25PL 6.8K $\Omega$	2
265034	C34, 35, 46, 53, 54	ELECT. CAPACITOR 470 $\mu$ F 10V	5	265111	R213	RESISTOR S-25PL 4.7K $\Omega$	1
265035	C33	ELECT. CAPACITOR 220 $\mu$ F 50V	1	265112	R212, 217, 222	RESISTOR S-25PL 3.3K $\Omega$	3
265036	C13, 14, 36	ELECT. CAPACITOR 220 $\mu$ F 10V	3	265164	SW2, 3, 4, 5, 6, 7, 8	TACT SWITCH KHC-10901	7
265037	C39, 42	ELECT. CAPACITOR 100 $\mu$ F 16V	2	265165	46	CONNECTOR PLUG TA-2650-6P-A	1
265038	C44, 50, 51	ELECT. CAPACITOR 100 $\mu$ F 10V	3	265166	47	CONNECTOR PLUG TA-2650-15P-A	1
265039	C21, 22	ELECT. CAPACITOR 47 $\mu$ F 35V	1	265156		JUMPER LEAD 12.5 mm	9
265040	C32	ELECT. CAPACITOR 47 $\mu$ F 25V	1	SWITCHING PCB SECTION			
265041	C11, 12, 15, 16, 37, 40	ELECT. CAPACITOR 47 $\mu$ F 16V	6	265016		PCB RA-26509	1
265042	C1, 2	ELECT. CAPACITOR 1 $\mu$ F 50V	2	265014	Q41, 42, 43, 44, 45, 46, 47, 48, 49	FET 2SK-30A (O, Y, GR) Transistor	14
265056	C23, 24, 29, 30, 48, 49	MYLAR CAPACITOR 0.047 $\mu$ F	6	265012	Q59, 61, 62, 63, 64, 65	TR 2SC-1815 (O, Y)	6
265074	C31, 38, 41, 43, 45, 47, 52	CERAMIC CAPACITOR 0.01 $\mu$ F	7	265013	Q55, 56, 57, 58, 60	TR 2SA-1015 (O, Y)	5
265067	C5, 6	CERAMIC CAPACITOR 470PF	2	265024	D21, 22, 23, 24, 25, 26	DIODE 1S-1555	6
265068	C19, 20, 25, 26, 27, 28	CERAMIC CAPACITOR 100PF	6	265168	IC-1	IC NJM 4558 DD	1
265069	C3, 4	CERAMIC CAPACITOR 68PF	2	265169	IC-2	IC TA-7324P	1
265070	C7, 8, 9, 10	CERAMIC CAPACITOR 33PF	4	265037	C109, 110, 111, 112	ELECT. CAPACITOR 100 $\mu$ F 16V	4
265071	C17, 18	CERAMIC CAPACITOR 10PF	2	265049	C85, 86	ELECT. CAPACITOR 33 $\mu$ F 16V	2
RESISTORS				265044	C91, 92, 103, 104, 105, 106, 115, 120, 121	ELECT. CAPACITOR 4.7 $\mu$ F 50V	9
265077	R68	RESISTOR 120 $\Omega$ 3W	1	265051	C81, 82	ELECT. CAPACITOR 3.3 $\mu$ F 50V	2
265078	R43, 44, 45, 46	RESISTOR 0.47 $\Omega$ 3W	4	265042	C93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 122	ELECT. CAPACITOR 1 $\mu$ F 50V	11
265079	R71	RESISTOR 270 $\Omega$ 2W	1	265056	C83, 84	MYLAR CAPACITOR 0.047 $\mu$ F	2
265080	R64	RESISTOR 680 $\Omega$ 1W	1	265057	C89, 90	MYLAR CAPACITOR 0.0082 $\mu$ F	2
265081	R47, 48	RESISTOR 10 $\Omega$ 1W	2	265058	C87, 88	MYLAR 0.0022 $\mu$ F	2
265082	R39, 40, 41, 42	RESISTOR 220 $\Omega$ 1/4W	4	265074	C113, 114, 116, 117, 118, 119	CERAMIC 0.01 $\mu$ F	6
265083	R56	RESISTOR 100 $\Omega$ 1/4W	1	265068	C107, 108	CERAMIC 100PF	2
265084	R61	RESISTOR S-25PL 270K $\Omega$	1	RESISTORS			
265085	R3, 4, 62	RESISTOR S-25PL 56K $\Omega$	3	265113	R159, 160, 161, 162, 163, 164, 165	S-25PL 10K $\Omega$	14
265086	R17, 18, 59, 75, 76, 79, 80	RESISTOR S-25PL 47K $\Omega$	7	265114	166, 167, 168, 169, 170, 171, 172, 175, 126, 131, 132, 134, 139, 140, 141, 142, 143, 144, 145, 146, 149, 150, 153, 154	RESISTOR S-25PL 1K $\Omega$	18
265087	R63	RESISTOR S-25PL 18K $\Omega$	1	265115	R205, 206	RESISTOR S-25PL 330K $\Omega$	2
265088	R67, 72	RESISTOR S-25PL 15K $\Omega$	2	265116	R193	RESISTOR S-25PL 120K $\Omega$	1
265089	R5, 6, 21, 22, 73, 74	RESISTOR S-25PL 10K $\Omega$	6	265117	R155, 156	RESISTOR S-25PL 100K $\Omega$	2
265090	R58, 60	RESISTOR S-25PL 6.8K $\Omega$	2	265118	R147, 148, 196	RESISTOR S-25PL 68K $\Omega$	3
265091	R69	RESISTOR S-25PL 5.6K $\Omega$	1	265119	R121, 122, 137, 138	RESISTOR S-25PL 47K $\Omega$	4
265092	R49, 50, 57, 70	RESISTOR S-25PL 4.7K $\Omega$	4	265120	R129, 130	RESISTOR S-25PL 33K $\Omega$	2
265093	R27, 28, 29, 30	RESISTOR S-25PL 3.3K $\Omega$	4	265121	R197, 199, 201, 203	RESISTOR S-25PL 18K $\Omega$	4
265094	R31, 32	RESISTOR S-25PL 2.7K $\Omega$	2	265122	R194	RESISTOR S-25PL 15K $\Omega$	1
265095	R51, 52, 55	RESISTOR S-25PL 2.2K $\Omega$	3	265123	R173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 157, 184, 185, 186, 187, 188, 189, 190, 191, 198, 200, 202, 204	RESISTOR S-25PL 10K $\Omega$	25
265096	R65, 66	RESISTOR S-25PL 1.8K $\Omega$	2	265124	R151, 152	RESISTOR S-25PL 8.2K $\Omega$	2
265097	R1, 2, 37, 38, 77, 78, 81, 82	RESISTOR S-25PL 1K $\Omega$	8	265125	R195	RESISTOR S-25PL 4.7K $\Omega$	1
265098	R11, 12, 23, 24, 53, 54	RESISTOR S-25PL 470 $\Omega$	6	265126	R192	RESISTOR S-25PL 1K $\Omega$	1
265099	R13, 14, 15, 16	RESISTOR S-25PL 330 $\Omega$	4	265127	R135, 136	RESISTOR S-25PL 470 $\Omega$	2
265100	R33, 34	RESISTOR S-25PL 270 $\Omega$	2	265128	R123, 124	RESISTOR S-25PL 47 $\Omega$	2
265101	R25, 26	RESISTOR S-25PL 100 $\Omega$	2	265129	R127, 128	RESISTOR S-25PL 680 $\Omega$	2
265102	R35, 36	RESISTOR S-25PL 68 $\Omega$	2	265170	J1	6P RCA JACK	1
265103	R7, 8, 9, 10	RESISTOR S-25PL 33 $\Omega$	4	265171	J2	4P RCA JACK	1
265104	R83, 84	RESISTOR S-25PL 18 $\Omega$	2	265172	J3	5P DIN JACK TCS-4650-01-111	1
265105	R19, 20	RESISTOR S-25PL 560 $\Omega$	2	265173	J4	7P DIN JACK TCS-4670-01-111	1
265160	RY1	RELAY G2Z-222P-US	1	265177	37	CONNECTOR SOCKET L25-015	1
265147	VR1	VR. E1ECF06-250KBX2, VOLUME	1	265178	38	CONNECTOR PLUG TA-2650-5P-A	1
265148	VR2	VR. K16110ATTE-500KW, BALANCE	1	265156		JUMPER LEAD 12.5 mm	17
265151	34	SOCKET S25-005, CONNECTOR	1				
265152		HEAT SINK A-500D (SMALL)	2				
265153		LAPPING PIN	11				
265154		CONNECTOR PIN W/BASE 3P	2				
265155		CONNECTOR PIN W/BASE 6P	1				
265156		JUMPER LEAD 12.5 mm	34				
265157		PIN FOR PCB MOUNTING	1				
POWER PCB SECTION							
265015		PCB RA 26511	1				
265025	D42, 43, 44, 45	DIODE UO-5C	4				
265023	D41	DIODE S-5277	1				
265043	C152, 153	ELECT. CAPACITOR 4700 $\mu$ F 50V	2				
265044	C151	ELECT. CAPACITOR 4.7 $\mu$ F 50V	1				
265074	C154, 155	CERAMIC CAPACITOR 0.01 $\mu$ F DC 1.4KV	2				

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
TONE SW PCB SECTION				265153			
265018		PCB RA-26504-8	1			LAPPING PIN	2
CAPACITORS				DISPLAY PCB SECTION			
265059	C63, 64	MYLAR CAPACITOR 0.068 $\mu$ F	2	265019		PCB RA-26512-13	1
265056	C71, 72	MYLAR CAPACITOR 0.047 $\mu$ F	2	265180	D91	DISPLAY LED S-5009	1
265061	C75, 76	MYLAR CAPACITOR 0.033 $\mu$ F	2	265181	D61, 62, 63, 64	LED GL-9PR2	4
265062	C67, 68	MYLAR CAPACITOR 0.018 $\mu$ F	2	265024	D51, 52, 53, 54, 57, 58, 59, 60	DIODE 1S-1555	8
265063	C61, 62	MYLAR CAPACITOR 0.012 $\mu$ F	2	265030	D55, 56	DIODE 1N-60	2
265064	C69, 70	MYLAR CAPACITOR 0.0027 $\mu$ F	2	265053	C161, 162	ELECT. CAPACITOR 4.7 $\mu$ F 50V	2
265065	C65, 66	MYLAR CAPACITOR 0.0022 $\mu$ F	2				
265076	C73, 74	CERAMIC CAPACITOR 220PF	2	265138	R247, 248	RESISTOR S-25PL 56K $\Omega$	2
RESISTORS				265139	R251	RESISTOR S-25PL 33K $\Omega$	1
265130	R111, 112	RESISTOR 330 $\Omega$ 1W	2	265140	R252	RESISTOR S-25PL 12K $\Omega$	1
265131	R107, 108	RESISTOR S-25PL 1K $\Omega$	2	265141	R253	RESISTOR S-25PL 3.3K $\Omega$	1
265132	R95, 96, 101, 102	RESISTOR S-25PL 470K $\Omega$	4	265142	R250, 254	RESISTOR S-25PL 2.2K $\Omega$	2
265133	R93, 94, 103, 104, 109, 110	RESISTOR S-25PL 18K $\Omega$	6	265143	R241, 242	RESISTOR S-25PL 820 $\Omega$	2
265134	R99, 100	RESISTOR S-25PL 6.8K $\Omega$	2	265144	R245, 246	RESISTOR S-25PL 560 $\Omega$	2
265135	R91, 92	RESISTOR S-25PL 5.6K $\Omega$	2	265145	R249	RESISTOR S-25PL 470 $\Omega$	1
265136	R97, 98	RESISTOR S-25PL 3.3K $\Omega$	2	265146	R243, 244	RESISTOR S-25PL 220 $\Omega$	2
265137	R105, 106	RESISTOR S-25PL 1.5K $\Omega$	2				
265174	SW1	PUSH SWITCH SUF-52	1	265182	VR5	SEMI-FIXED 5K $\Omega$	1
265175	VR3, 4	TONE VR. K162A0B0CE-100KCx2	2	265183		CONNECTOR SOCKET TA-2650-6P-8	1
265176	J5	HEADPHONE JACK HLJ-0305-01-020	1	265156		JUMPER LEAD 12.5 m/m	2

## EXPLODED VIEW PARTS

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
265185	1	POWER SWITCH SDS-3P, SW9	1	MISCELLANEOUS			
265186	2	SPARKKILLER 0.047 $\mu$ F, C171, 172	2	265190		INSULATION TAPE	1
265187	3	POWER TRANSFORMER, T1 CEP-80E119	1	265191		LEAD WIRE	1 set
				265192		SCREW	1 set
265188	4	AC POWER CORD	1	265193		BINDER, LEAD	6
265189	5	CORD STOPPER	1	265194		TUBE 1.5 $\phi$ x 8 mm	8
265201	6	REAR PANEL	1	265195		TUBE 1.0 $\phi$ x 8 mm	26
265202	7	CHASSIS MOUNTING BRACKET	1	265196		INDIVIDUAL CARTON BOX	1
265203	8	CHASSIS FLAME (A)	1	265197		POLY BAG	1
265204	9	HEAT SINK ASSY	1 set	265198		INSTRUCTION MANUAL	1
265205	10	TR. BRACKET	1	265199		TENSAI CERTIFICATE	1
265206	11	POWER SW MOUNTING BRACKET	1	265200		SNOW BOX	1 pair
265235	12	PCB MOUNTING BRACKET	2	265229	35	KNOB, BALANCE/TONE	3
265207	13	SOCKET MOUNTING BRACKET	2	265230	36	SHAFT, Power SW	1
265208	14	H.D. FLAME	1	265231	37	CONNECTOR SOCKET L25-015	1
265209	15	HEAT SINK (SMALL)	2	265233	38	CONNECTOR PLUG 5P	1
265236	16	BRACKET, MAIN PCB	2	265234	39	4P DIN SPEAKER SOCKET, J6, J7 TCS-0425-01-010	2
265210	17	LED CASE	1	260514	40	PCB, RA-26501-3	1
265211	18	FOOT NO. 7102	4	260515	41	PCB, RA-26511	1
265212	19	LED DISPLAY	1	260516	42	PCB, RA-26509	1
				260517	43	PCB, RA-26510	1
265215	20	LED PLATE	1	260518	44	PCB, RA-26504-8	1
265216	21	LED ACRYL	1	260519	45	PCB, RA-26512-13	1
265237	22	STOPPER	1	265165	46	CONNECTOR PLUG 6P	1
265217	23	BONNET	1	265166	47	CONNECTOR PLUG 15P	1
265218	24	BOTTOM PLATE (A)	1	265183	48	CONNECTOR SOCKET 6P	1
265219	25	LED GUIDE	1				
265220	26	PUSH KNOB (A)	5				
265221	27	PUSH KNOB (B)	1				
265222	28	PUSH KNOB (E)	1				
265223	29	PUSH KNOB (F)	4				
265224	30	PUSH KNOB (G)	2				
265225	31	DECORATION SCREW	1				
265226	32	ACRYL, PANEL	1				
265227	33	FRONT PANEL	1				
265228	34	FRONT PANEL COVER	1				

## 2. TI2600 [Remote Control Receiver with Built in timer]

TI2600

### 2-1 SPECIFICATIONS

Clock.....	24 hours digital
Indication method.....	4 7-segment LEDs
Timer .....	Set by units of "minutes" for 24 hours
Timer accuracy.....	Monthly loss/gain: within 10 seconds
Auto-off, Aut-on.....	1 minute to 23 hours 59 minutes
Sleep timer .....	Set by units of "minutes" for 59 — 1 minute
AC outlet .....	550 VA
Power consumption .....	9W
Dimensions (W × H × D).....	430 × 80 × 250 mm
Weight .....	3.8 kg

### 2-2 ALIGNMENT

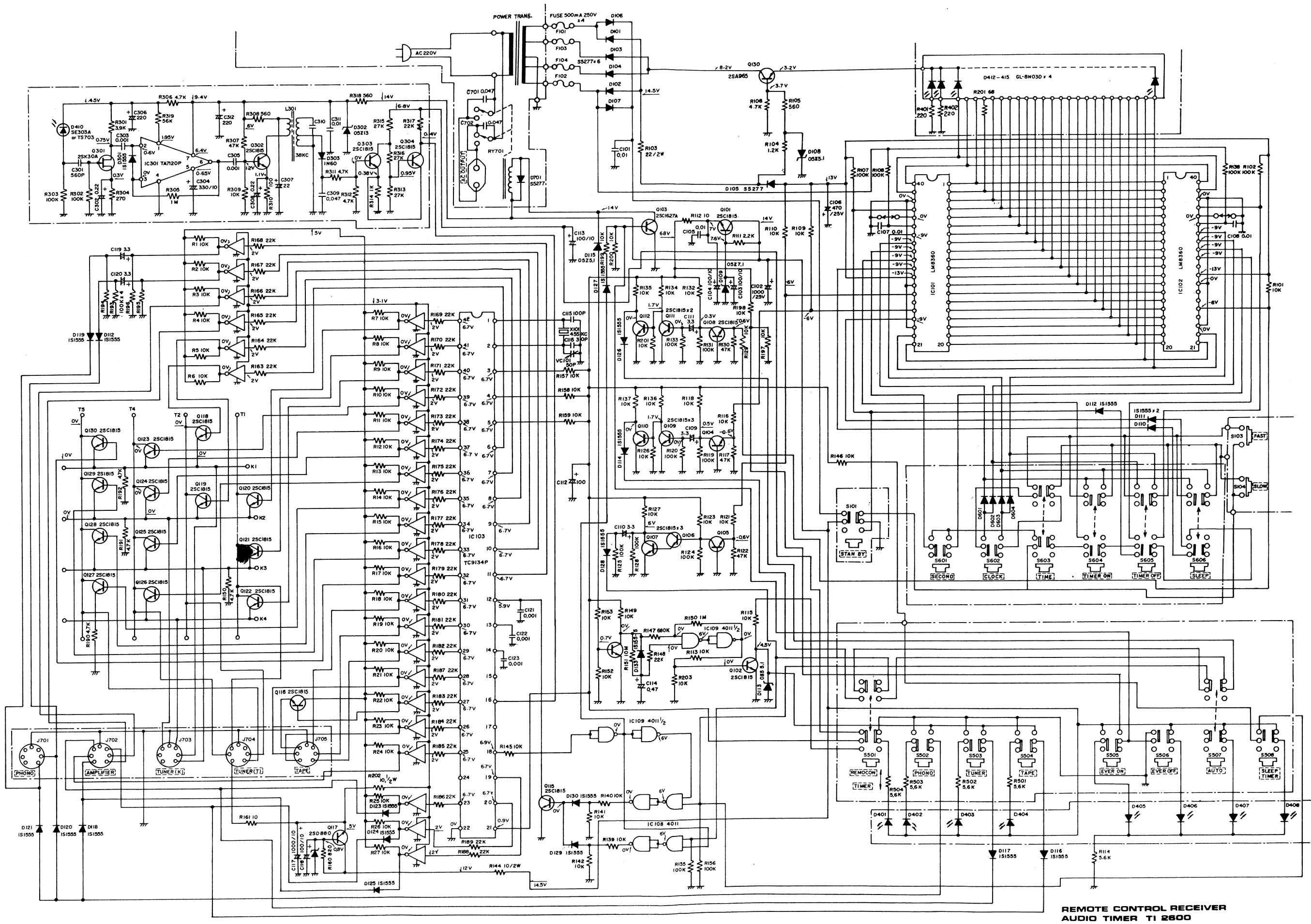
#### TI-2600 REMOTE CONTROL RECEIVER/AUDIO TIMER ALIGNMENT PROCEDURES

**1) Adjustment of oscillation frequency**

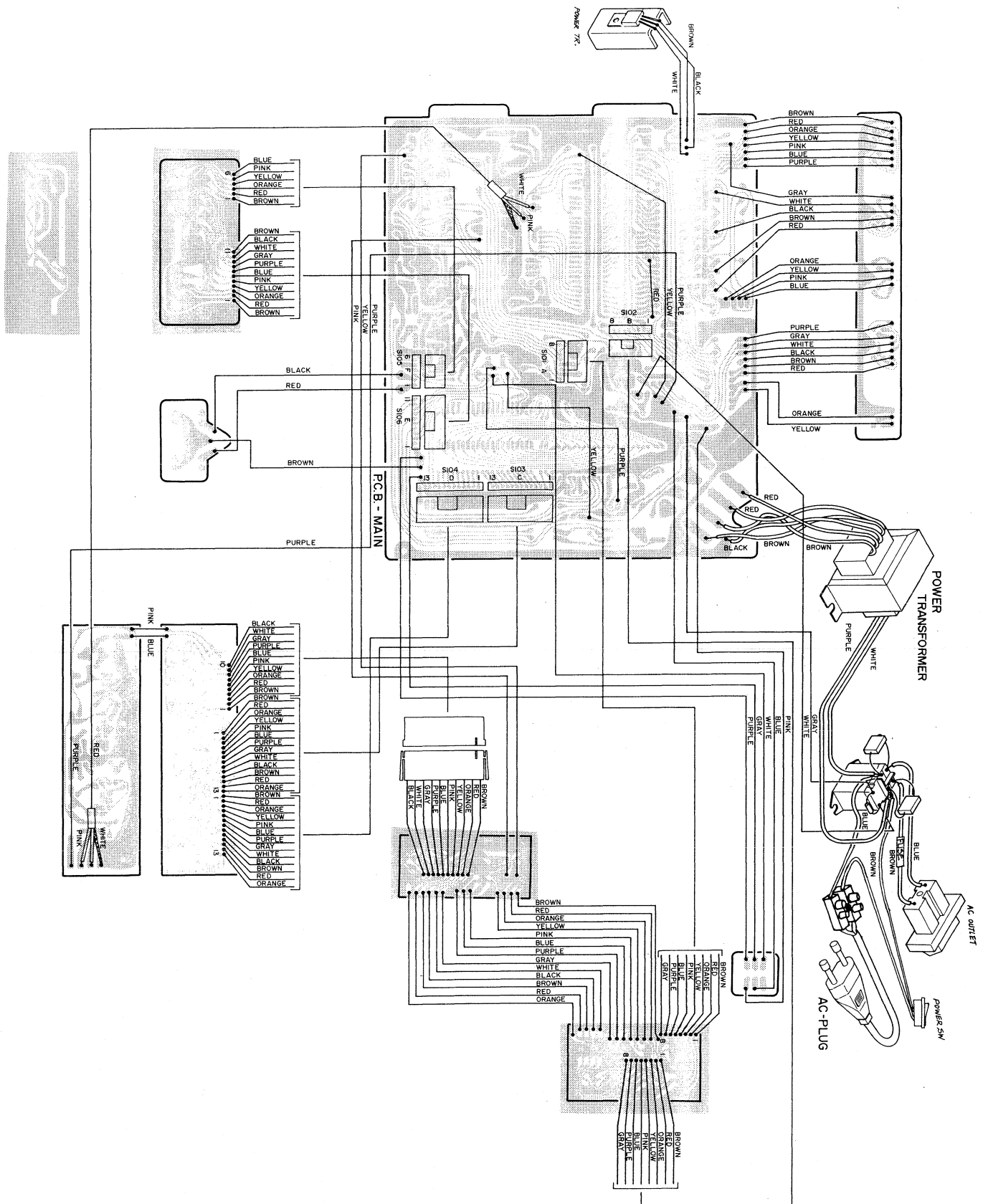
Depress the standby switch and connect the frequency counter to the test point of 455 KHZ. Set the frequency by VC101 to be within 455 KHZ plus/minus 2 KHZ.

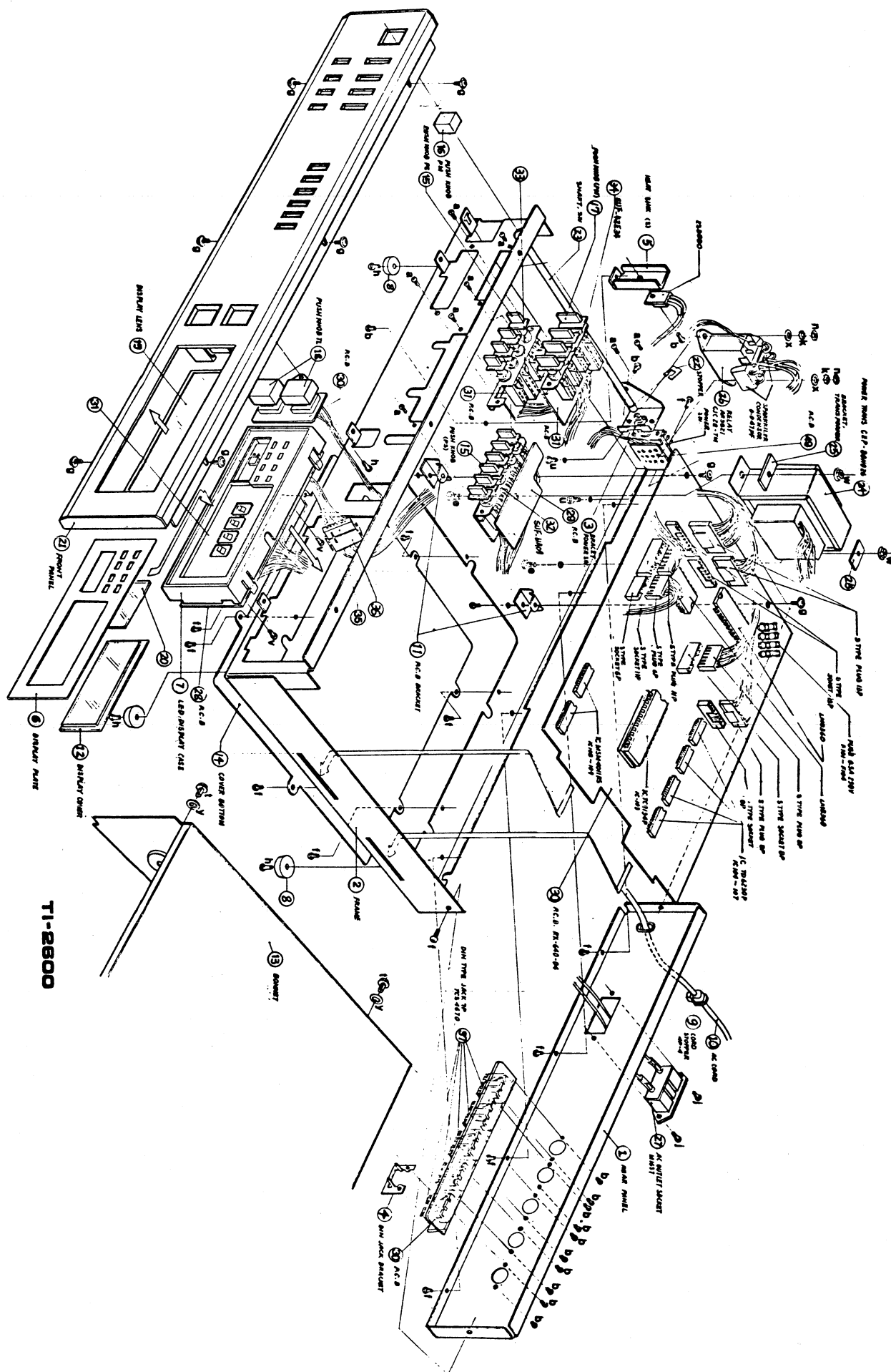
**2) Adjustment of 38 KHZ tuning coil**

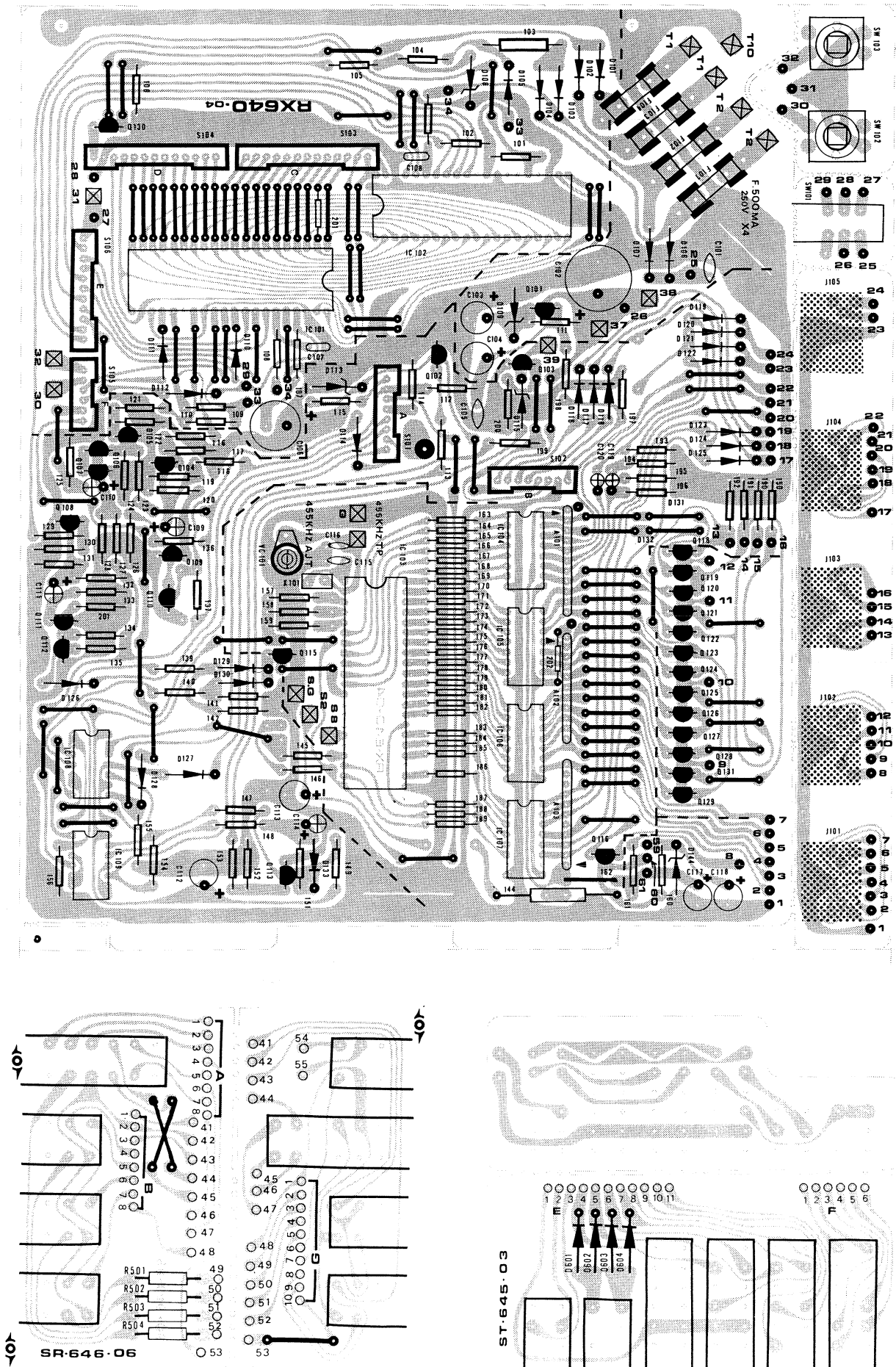
Depress the standby switch and apply approximately 10 mV to the gate of EFT Q301 on the 38 KHZ frequency. Connect the milivolt meter to the cathod D303 and adjust L301 so that the output may become at its maximum.

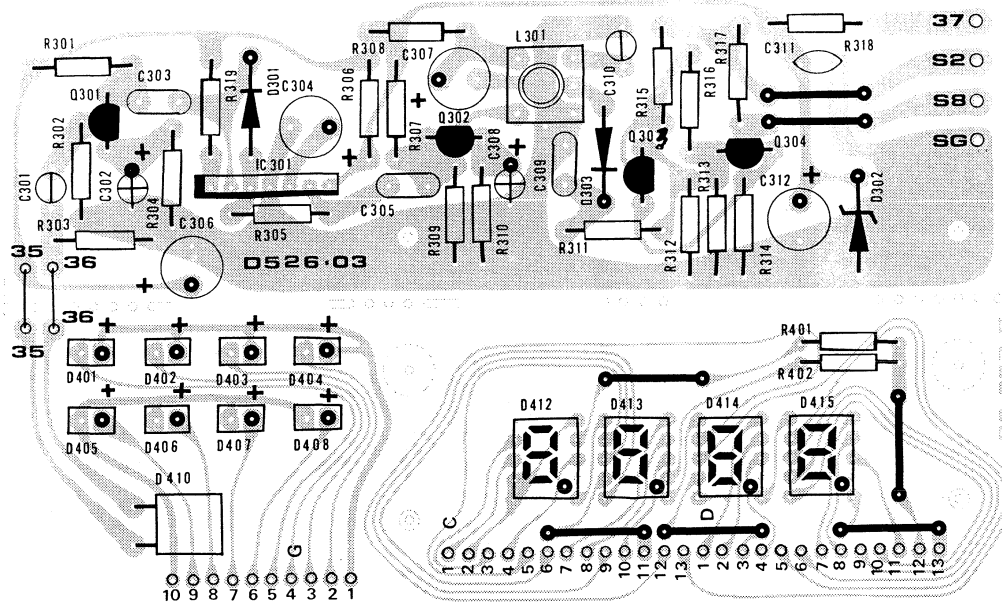












## 2-7 PARTS LIST

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
<b>LED DISPLAY SECTION</b>				260035		PCB SR-646-06	1
260034		PCB D-526-03	1	260083		PUSH SWITCH SUF 42E 34	1
260066	D412, 413, 414, 415	LED GL-8N03D	4	260084		PUSH SWITCH SUF 42E 33	1
265181	D401, 402, 403, 404, 405, 406, 407, 408	LED GL-9PR2	8	260015	R504, 503, 502, 501	RESISTOR 5.6K $\Omega$ 2/8W	4
260071	IC301	IC TA7120P	1	265156		JUMPER LEAD 12.5 mm	2
260061	Q304, 303, 302	TR. 2SC 1815 (Y)	3	260086		SOCKET T1-2600-8P-03	2
265014	Q301	FET 2SK 30A	1	260141		SOCKET T1-2600-10P-06	1
812068	D303	DIODE 1N-60	1	260036		PCB ST-645-03	1
265024	D301	DIODE 1S-1555	1	265024	D601, 602, 603, 604	DIODE 1S-1555	4
265023	D302	ZENOR DIODE 05Z-13	1	260087		SOCKET T1-2600-11P-02	1
260073	D410	INFRA-RED HOT DIODE TPS-703	1	260088		SOCKET T1-2600-6P-01	1
260074	L301	COIL S103175	1	260089		PUSH SWITCH SUF-61A09	1
<b>CAPACITORS</b>				260090		POWER XFORMER CEP-80H026	1
260045	C304	ELECT. CAP. 330 $\mu$ F 10V	1	260091		RELAY AR3821	1
260046	C306, C312	ELECT. CAP. 220 $\mu$ F 16V	2	260092		AC SOCKET M1657 2.5A-250V	1
260047	C307	ELECT. CAP. 22 $\mu$ F 25V	1	265188		POWER CORD	1
260075	C301	STYROL CAP. 560PF	1	265189		CORD STOPPER 4K-4	1
260076	C310	STYROL CAP. 820PF	1	265186		SPARKKILLER 0.047 $\mu$ F	2
265056	C309	MYLAR CAP. 0.047 $\mu$ F	1	260096		FUSE 500 mA 250V 5 $\phi$	4
260052	C303, C305	MYLAR CAP. 0.001 $\mu$ F	2	260042		DIODE 1S 1885	1
260060	C311	CERAMIC CAP. 0.01 $\mu$ F	1	260037		PCB RX-640-04	1
812221	C302	TANTAL CAP. 0.22 $\mu$ H 16V	1	260098	IC103	IC TC9134P	1
260078	C308	TANTAL CAP. 0.1 $\mu$ F 16V	1	260099	IC101, 102	IC LM8360	2
<b>RESISTORS</b>				260100	IC109, 108	IC MSM-4011RS	2
260001	R310	RESISTOR 100 $\Omega$ 2/8W	1	260101	IC104, 105, 106, 107	IC TD 6230 P	4
812085	R401, 402	RESISTOR 220 $\Omega$ 2/8W	2	260097		Fuse 2.5A 250V	1
260003	R304	RESISTOR 270 $\Omega$ 2/8W	1	<b>TRANSISTORS</b>			
812083	R318, 308	RESISTOR 560 $\Omega$ 2/8W	2	265011	Q117	TR 2SD880 (Y)	1
812081	R314	RESISTOR 1K $\Omega$ 2/8W	1	265010	Q103	TR 2SC1627A (Y)	1
260006	R301	RESISTOR 3.9K $\Omega$ 2/8W	1	265004	Q130	TR 2SA 965 (Y)	1
260007	R311, R306, R316	RESISTOR 4.7K $\Omega$ 2/8W	3	265007	Q101, 102, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 115, 116, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 131	TR 2SC 1815 (Y)	27
812078	R309	RESISTOR 10K $\Omega$ 2/8W	1	<b>DIODES</b>			
812076	R317	RESISTOR 22K $\Omega$ 2/8W	1	265023	D101, 102, 103, 104, 105, 106, 107	DIODE S5277	7
260010	R313, 316, 315	RESISTOR 27K $\Omega$ 2/8W	3	265024	D110, 111, 112, 114, 116, 117, 118	DIODE 1S1555	20
812075	R307	RESISTOR 47K $\Omega$ 2/8W	1				
260012	R319	RESISTOR 56K $\Omega$ 2/8W	1	265033	D109	ZENOR DIODE 05Z7.5	1
812072	R303, 302	RESISTOR 100K $\Omega$ 2/8W	2	260103	D144	ZENOR DIODE 05Z5.6	1
260014	R305	RESISTOR 1M $\Omega$ 2/8W	1	260104	D115, 113, 108	ZENOR DIODE 05Z5.1	3
265156		JUMPER LEAD 12.5 mm	7	260105	A1, 2, 3	RESISTOR 10K $\Omega$ 10R TYPE	3
260081		SOCKET 13P T1-2600-13P-04	2	260054	X1	CERAMIC OSCILLATOR KBR-455(B)	1
260082		PLUG 10P T1-2600-10P-05	1				



PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
<b>CAPACITORS</b>				260027	R101, 109, 110, 113, 115, 116, 118, RESISTOR 10K $\Omega$ 1/8W		35
260055	VC101	CERAMIC TRIMMER 50P	1	121, 123, 126, 127, 129, 132, 134,			
260056	C101, 105	CERAMIC CAP. SL 0.01 $\mu$ F	2	135, 136, 137, 139, 140, 141, 142,			
260057	C115	CERAMIC CAP. NPO 100PF	1	145, 146, 149, 152, 153, 157, 158,			
260058	C116	CERAMIC CAP. NPO 30PF	1	159, 197, 198, 199, 200, 201			
260059		CERAMIC CAP. 0.001 $\mu$ F	3	260028	R148, 163, 164, 165, 166, 167, 168, RESISTOR 22K $\Omega$ 1/8W		28
812156	C108, 107	MYLAR CAP. 0.01 $\mu$ F	2	169, 170, 171, 172, 173, 174, 175,			
260106	C110, 109, 111, 119, 120	TANTAL CAP. 3.3 $\mu$ F 16V	5	176, 177, 178, 179, 180, 181, 182,			
260107	C114	TANTAL CAP. 0.47 $\mu$ F 16V	1	183, 184, 185, 186, 187, 188, 189			
812028	C102	ELECT. CAP. 1000 $\mu$ F 25V	1	260029	R117, 122, 130	RESISTOR 47K $\Omega$ 1/8W	3
812029	C106	ELECT. CAP. 470 $\mu$ F 25V	1	260030	R102, 107, 108, 119, 120, 124, 125, RESISTOR 100K $\Omega$ 1/8W		17
265038	C103, 104, 112, 113, 117, 118	ELECT. CAP. 100 $\mu$ F 10V	6	128, 131, 133, 138, 155, 156, 193,			
<b>RESISTORS</b>				194, 195, 196			
260016	R103	RESISTOR 22 $\Omega$ 2W	1	260031	R138, 147	RESISTOR 680K $\Omega$ 1/8W	2
260017	R144	RESISTOR 10 $\Omega$ 2W	1	260032	R154	RESISTOR 1M $\Omega$ 1/8W	1
260018	R202	RESISTOR 10 $\Omega$ 1/2W	1	260033	R151	RESISTOR 10M $\Omega$ 1/8W	1
260019	R201	RESISTOR 68 $\Omega$ 1/8W	1	265156		JUMPER LEAD 12.5 m/m	92
260020	R112, 161	RESISTOR 10 $\Omega$ 1/8W	2	265150		FUSE HOLDER 5 $\phi$	8
260021	R105	RESISTOR 470 $\Omega$ 1/8W	1	265153		LAPPING PIN	16
260022	R160	RESISTOR 820 $\Omega$ 1/8W	1	260111		FUSE 0.5A 250V 5 $\phi$	4
260023	R104	RESISTOR 1.2K $\Omega$ 1/8W	1	265164		TACT SW KHC-10901	2
260024	R111	RESISTOR 2.2K $\Omega$ 1/8W	1	260114		SINGLE SW SUE 12KG5	1
260025	R106, 150, 190, 191, 192	RESISTOR 4.7K $\Omega$ 1/8W	5	260115		SOCKET S TYPE 13P	2
260026	R114	RESISTOR 5.6K $\Omega$ 1/8W	1	260116		SOCKET S TYPE 11P	1
				260117		SOCKET S TYPE 8P	2
				260118		SOCKET S TYPE 6P	1
				265173		DIN JACK 7P TCS4670	5

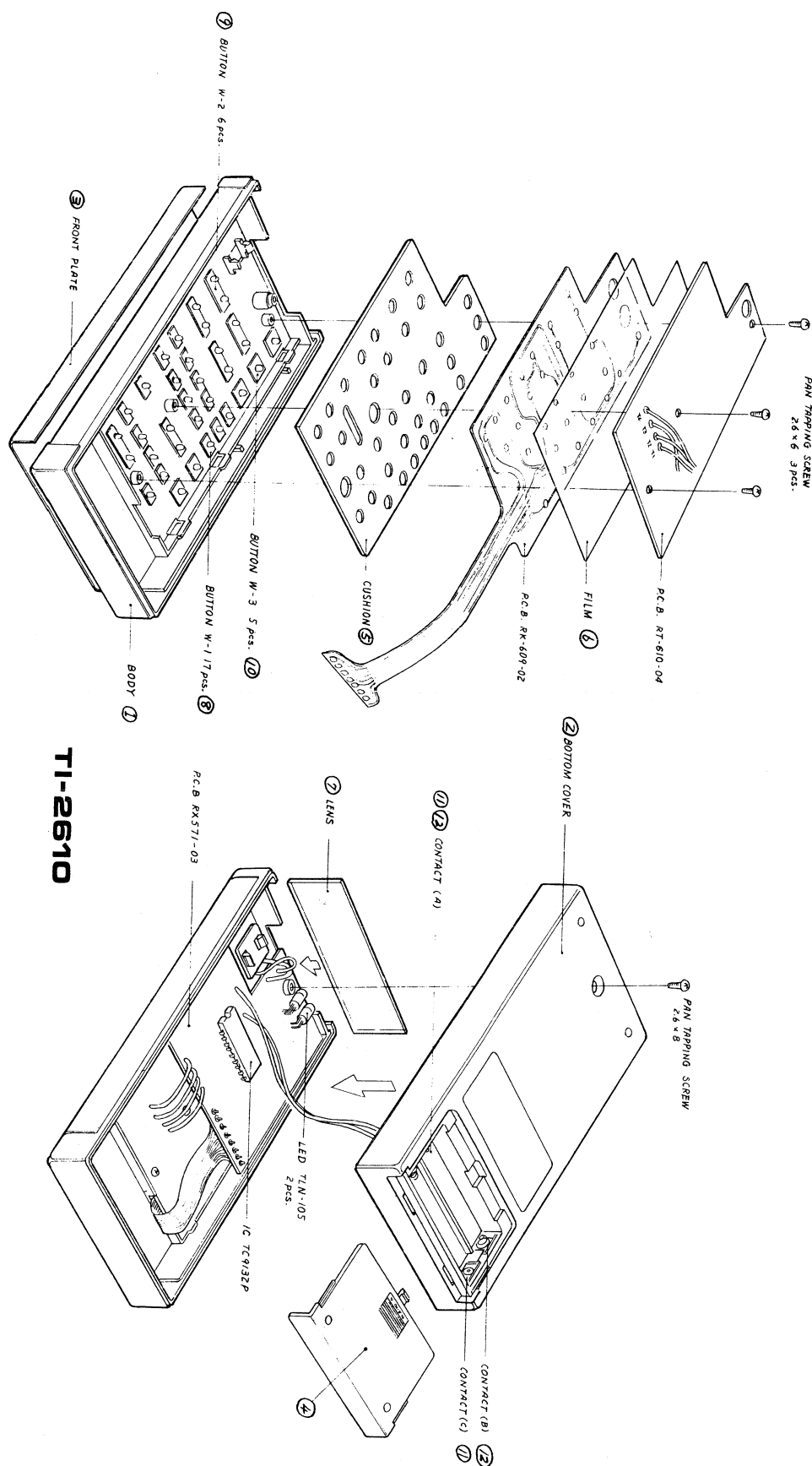
EXPLODED VIEW PARTS

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
260121	1	REAR PANEL	1	<b>MISCELLANEOUS</b>			
260122	2	CHASSIS FLAME	1	260139		INSULATION COVER	2
265206	3	POWER SW MOUNTING BRACKET	1	260097		7P DIN CORD	4
265207	4	SOCKET MOUNTING BRACKET	5	260125		INSTRUCTION MANUAL	1
265209	5	HEAT SINK	1	265199		TENSAI CERTIFICATE	1
265215	6	LED PLATE	1	265200		SNOW BOX	1 PAIR
265210	7	LED CASE	1	260126		SCREW	1 SET
265211	8	FOOT No. 7102	4	265197		POLY BAG	1
265189	9	CORD STOPPER 4K-4	1	260127		INDIVIDUAL CARTON	1
265188	10	AC CORD	1	260128		LEAD WIRE	1 SET
260138	11	PCB MOUNTING BRACKET	2	265193		BINDER, LEAD	15
265216	12	LED ACRYL	1	364768		BATTERY UM-3X3	3
265217	13	BONNET	1	260120		SCREW	1 SET
260130	14	BOTTOM PLATE (A)	1				
265220	15	PUSH KNOB (A)	10				
265221	16	PUSH KNOB (B)	1				
260133	17	PUSH KNOB (D)	4				
265224	18	PUSH KNOB (G)	2				
265226	19	PANEL ACRYL	1				
260136	20	PHOTO DIODE ACRYL	1				
260137	21	FRONT PANEL	1				
265237	22	STOPPER, SHAFT	1				
265230	23	SHAFT, POWER SW	1				
260090	24	POWER XFORMER	1				
260140	25	BRACKET, POWER XFORMER	2				
260091	26	RELAY	1				
260092	27	AC OUTLET	1				
260034	28	PCB, D-526-03	1				
260036	29	PCB, ST-645-03	1				
260037	30	PCB, RX-640-04	1				
260035	31	PCB, SR-646-05	1				
260089	32	PUSH SW, SUF-61A09	1				
260084	33	PUSH SW, SUF 42E33	1				
260083	34	PUSH SW, SUF 42E34	1				
260082	35	PLUG, 10P-5	1				
260141	36	SOCKET, 10P-6	1				
265173	37	DIN JACK 7P	5				

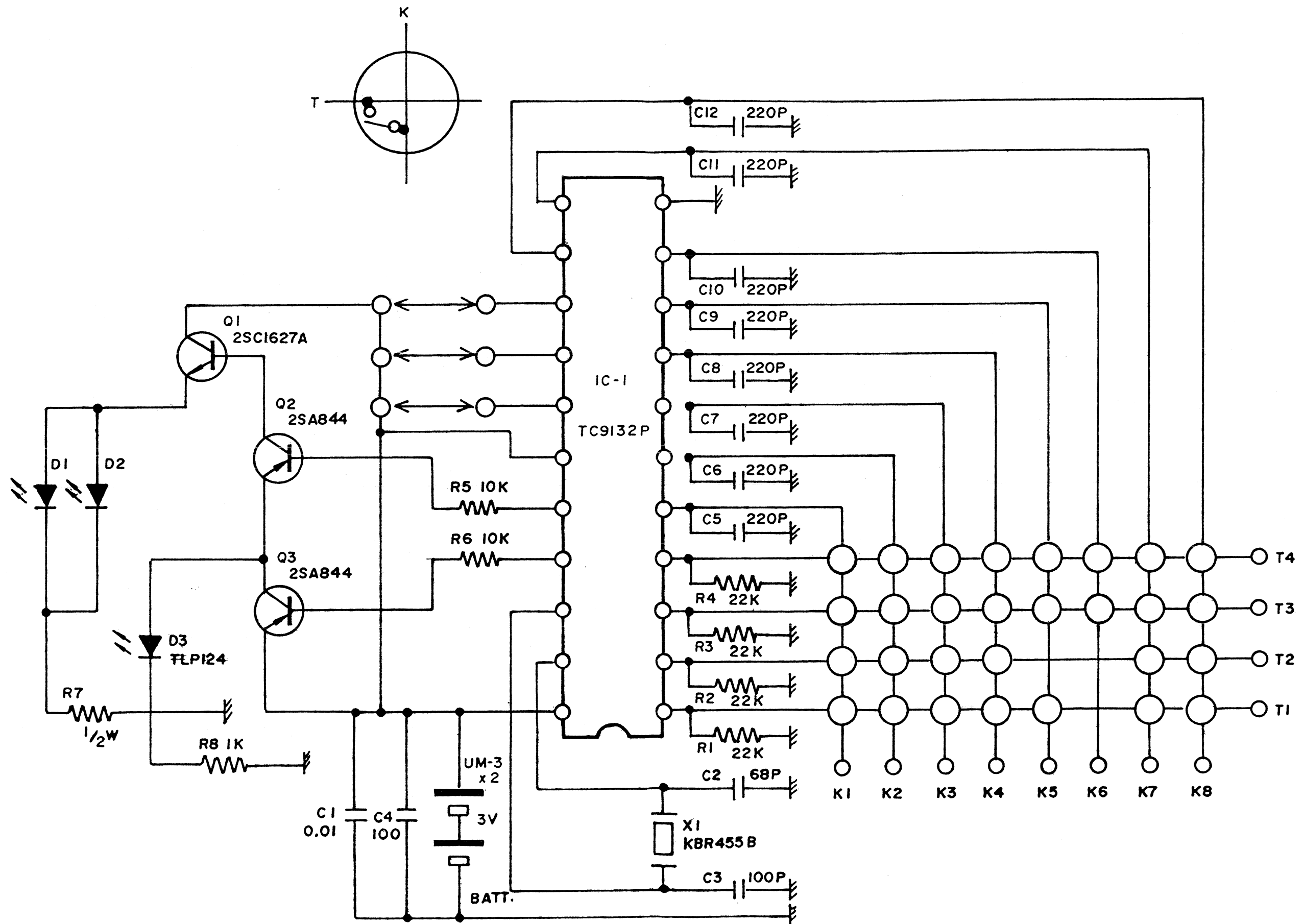
### 3. TI2610 { Remote Control Transmitter }

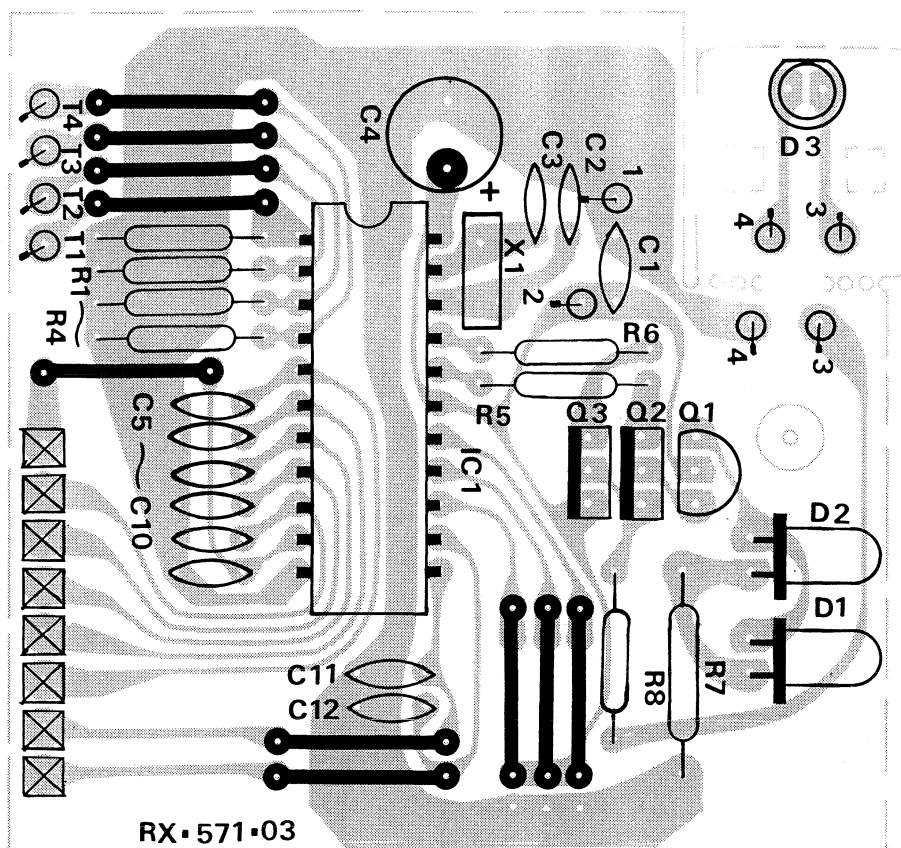
TI2610

#### 3-1 EXPLODED VIEW



TI-2610





## 3-4 PARTS LIST

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
261001		PCB RX-571-03	1	<b>EXPLODED VIEW PARTS</b>			
261018	IC1	IC TC-9132P	1	261021	F-90400	UPPER CASE	1
265163	D3	LED TLR124	1	261022	F-90388	BOTTOM CASE	1
261020	D1, D2	LED TLN-105	2	261023	D-90385	PLATE	1
261004	Q2, Q3	TRANSISTOR 2SA844(E)	2	261024	C-10988	BATTERY COVER	1
265010	Q1	TRANSISTOR 2SC1627(A)	1	261025	C-10984	CUSHION FOR KNOBS	1
261039	X1	CERAMIC OSCILLATOR KBR-455B	1	261026	C-10983	INSULATION PLATE	1
<b>CAPACITORS</b>				261027	C-10982	LENS FOR TRANSMITTING WINDOW	1
265076	C5 ~ C12	CERAMIC 220PF-SL	8	261028	C-10985	KNOB (W-1)	17
265074	C1	" 0.01μF-SL	1	261029	C-10986	KNOB (W-2)	6
261008	C3	" 100PF NPO	1	261030	C-10987	KNOB (W-3)	5
261009	C2	" 68PF NPO	1	261031	C-21002	ELECTRODE PLATE (A, C)	2
261014	C4	ELECT. 100μF 6.3V	1	261032	C-21003	ELECTRODE SPRING (A, B)	2
<b>RESISTORS</b>				<b>MISCELLANEOUS</b>			
261010	R1 - R4	2/8W 22KΩ	4	261034	D-90389	SNOW CASE	1
261011	R6, R5	" 10KΩ	2	261035	C-21019	COVER, SNOW CASE	1
261012	R8	" 1KΩ	1	261036		INSTRUCTION MANUAL	1
261013	R7	1W 1Ω	1	265199		TENSAI CERTIFICATE	1
261015		JUMPER LEAD 12.5 m/m	10	261038		SNOW BOX	1 SET
261016		LAPPING PIN	8	265193		LEAD WIRE	1
261002		PCB RK-609-02	1	261037		POLY BAG	1 SET
261003		PCB RT-610-04	1	261033		SCREW	2
				364768		BATTERY UM-3	



## 4-1 SPECIFICATIONS

## FM SECTION

Tuning Range	87.5 — 108 MHz
Antenna Impedance	300 ohm balanced/ 75 ohm unbalanced
Usable Sensitivity	1.2 $\mu$ V
Selectivity	70 dB
Image Response Ratio	70 dB
IF Response Ratio	70 dB
AM Suppression Ratio	55 dB
Capture Ratio	2 dB
Harmonic Distortion	0.12%
(STEREO 1,000 Hz)	
Signal-to-Noise Ratio	60 dB
(MONO 400 Hz, 100% MOD)	
Stereo Separation	35 dB (1,000 Hz)
Frequency Response	18 — 17000 Hz
Output Level	315 mV/4.7 kohms

## MW SECTION

Tuning Range	522 — 1,611 kHz
Usable Sensitivity	400 $\mu$ V/m
Selectivity	30 dB
Image Response Ratio	35 dB (1,000 kHz)
IF Response Ratio	30 dB (1,000 kHz)
Output Level	315 mV/4.7 kohms

## LW/SECTION

Tuning Range	137 — 372 kHz
Usable Sensitivity	1 mV/m
Selectivity	30 dB
Image Response Ratio	40 dB (200 kHz)
IF Response Ratio	25 dB (200 kHz)
Output Level	315 mV/4.7 kohms
Power Consumption	17W
Dimensions (WHD)	430 × 80 × 250 mm
Weight	5.0 kg

Our policy is one of continuous development of our products and we may change specifications without notice.

## 4-2 ALIGNMENT

## TT-3645 FM/MW/LW DIGITAL SYNTHESIZER TUNER ALIGNMENT PROCEDURES

## A) DIGITAL SECTION ALIGNMENT

- Basic frequency**  
Connect the frequency counter to TEST (A) terminal and adjust it to 9.000 MHz by TC401 trimmer.
- CPU clock oscillation**  
(This is just for CLOCK inside of CPU, not related to the system)  
Connect the frequency counter to TEST (B) terminal and adjust it to 200 KHZ by T401 coil.

## B) ALIGNMENT FOR CONTROLLING THE LINEAR SECTION THROUGH DIGITAL SECTION

Connect + of tester to the lapping terminal 43 on the digital PCB (CPT-80H061B) and — of tester to the ground like chassis frame or something.  
Turn each trimmer and semi-fixed resistor to the centre condition, meanwhile, tuner up VR6 and VR7 semi-fixed resistors to the left direction.

## 1. FM BAND

- Adjust the frequency display to 87.50 MHz and set the tester at 1.5V by T6 coil.
  - Adjust the frequency display to 108.00 MHz and set the tester at 12V by TC4 trimmer.
  - Repeat the above adjustments a and b.
- Connect some unit like amplifier or oscilloscope to the output terminals to check the output. Set the bar antenna coil (LW=left MW=right) to the place of 15 mm from the core.

## 2. MW (LW) BAND

- Adjust the frequency display to 522 (137) KHZ and turn the T9 (T10) coil just until the output from the output terminal goes out. In this case, voltage is about 1V or a little over.
- Adjust the frequency display to 1611 (372) KHZ and set the tester at 9V by TC6 (TC5) trimmer.
- Repeat the above adjustments a and b.

## C) TRACKING ALIGNMENT

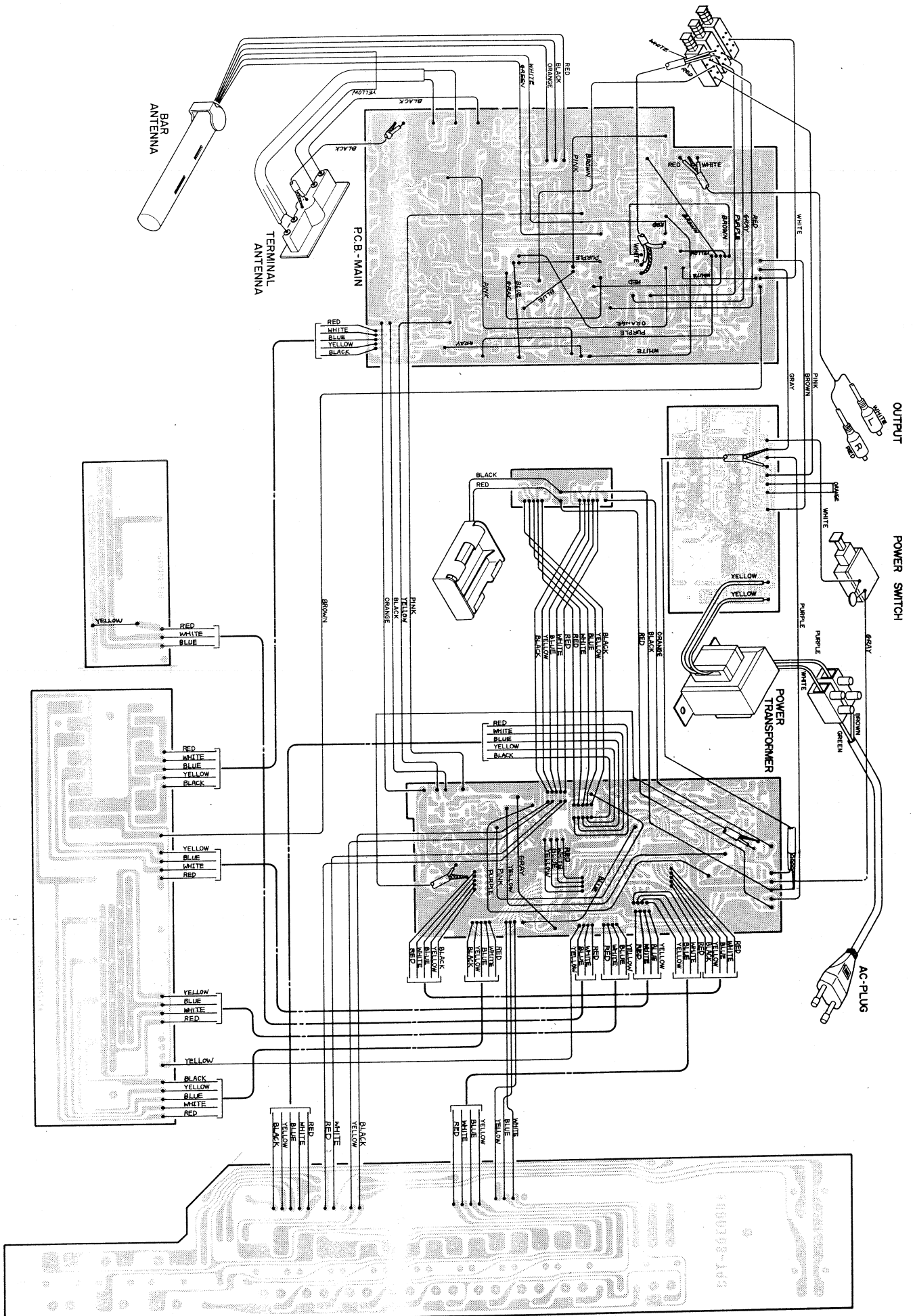
## 1. FM BAND

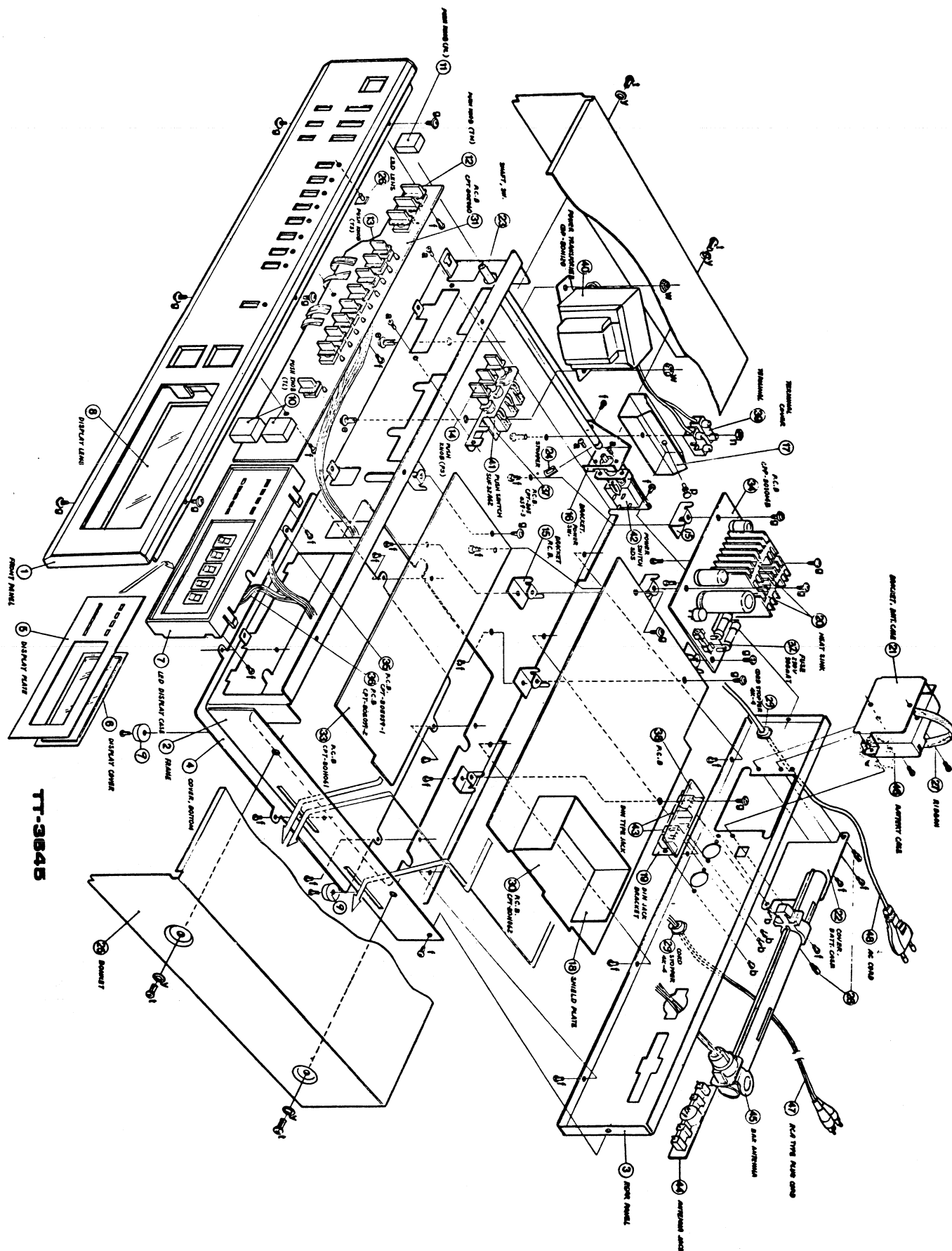
- Adjust the frequency display to 88.00 MHz and also set the SSG at 88.00 MHz. Then, turn T2, T3, T4 to get the maximum sensitivity by reducing the ATT.
- Adjust the frequency display to 107.00 MHz and also set the SSG at 107.00 MHz. Then, turn TC1, TC2, TC3 to get the maximum sensitivity by reducing the ATT.
- Repeat the above methods a and b to get the maximum sensitivity (about under 1 UV).

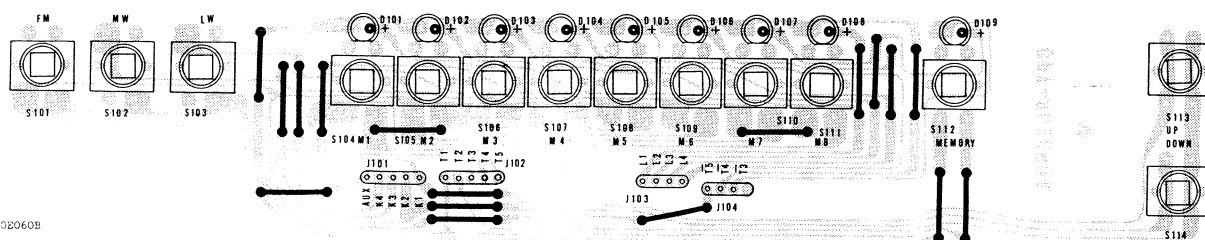
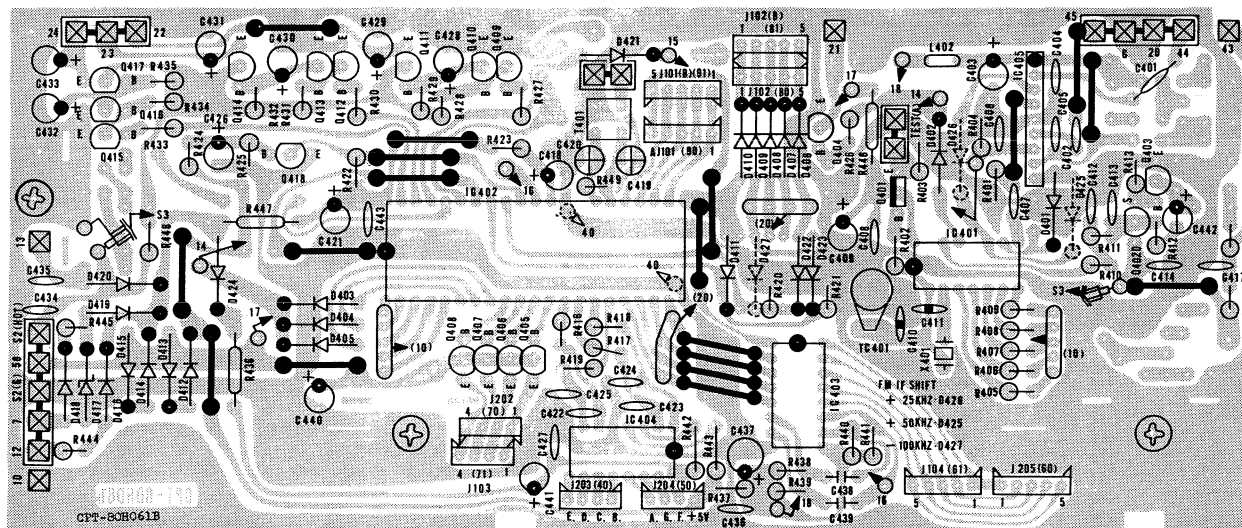
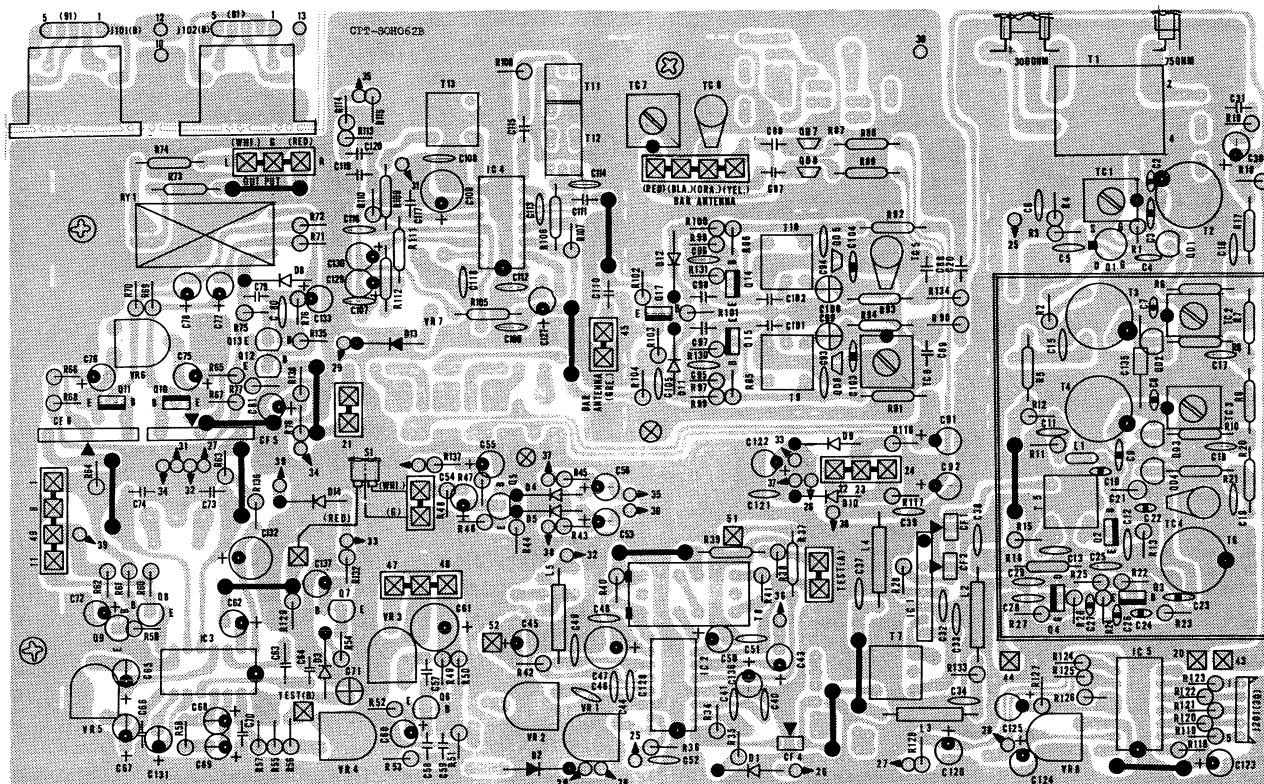
## 2. MW (LW) BAND

- Adjust the frequency display to 600 (160) KHZ and also set the SSG at 600 (160) KHZ. Then, move or slide the bar antenna coil (LW=left, MW=right) to get the maximum sensitivity by reducing the ATT. But when bar antenna coil is far from the core, set it at the place apart from 15 mm and get the maximum sensitivity by T9 (T10).
- Adjust the frequency display to 1450 (350) KHZ and also set the SSG at 1450 (350) KHZ. Then, turn TC6 (TC5) to get the maximum sensitivity by reducing the ATT.
- Repeat the above methods a and b to get the maximum sensitivity.

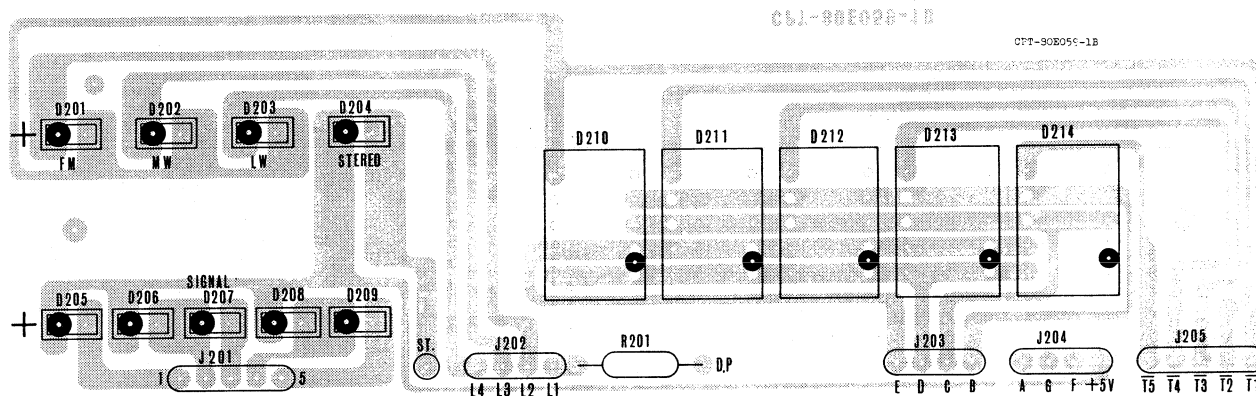
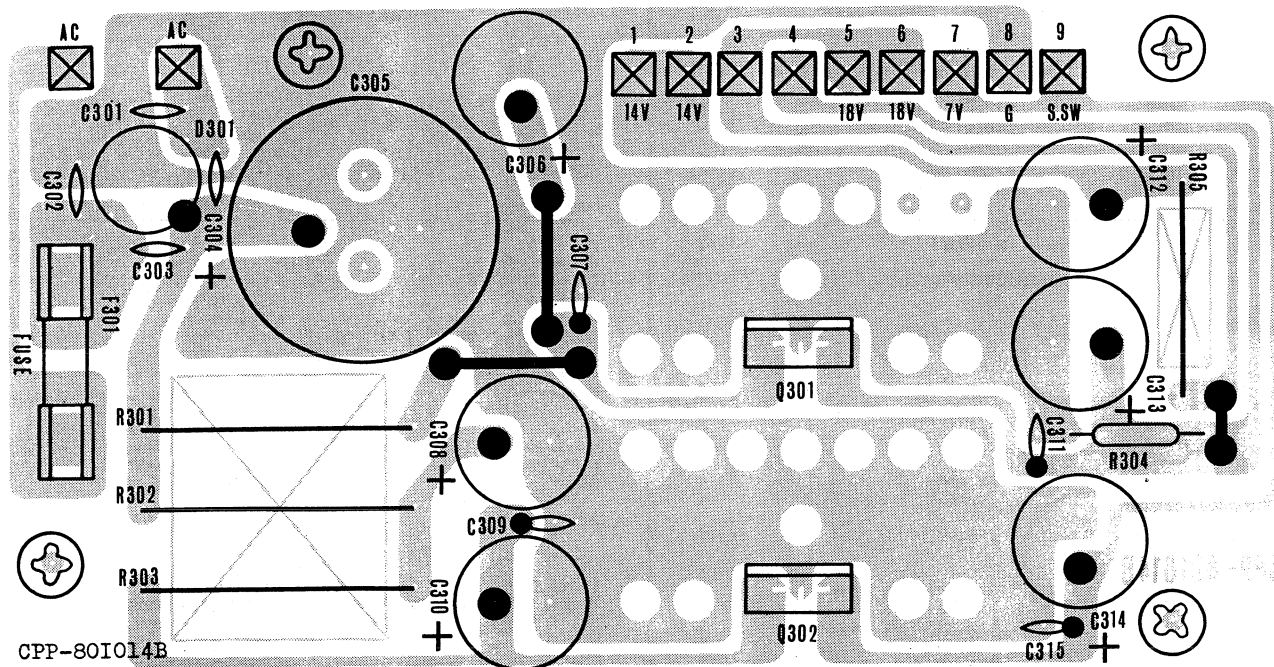














PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
364503		PCB MOUNTING BRACKET (B)		265046	C43, 53, 54, 127	ELECT. 35V. 10 $\mu$ F	4
		PCB MOUNTING SCREWS 3 $\times$ 6		812015	C81	ELECT. 16V. 22 $\mu$ F	1
364501		PCB CPT-80H062	1	265049	C75, 76	ELECT. 16V. 33 $\mu$ F	2
		ICs		265041	C55, 126	ELECT. 16V. 47 $\mu$ F	2
364511	IC4	IC HA-1197	1	265037	C47, 61, 109, 132	ELECT. 16V. 100 $\mu$ F	4
364512	IC3	IC HA-11223W	1				
364513	IC2	IC HA-11225	1	364678	C64	MYLAR 0.0015 $\mu$ F	1
364514	IC1	IC HA-1211	1	265065	C70	MYLAR 0.0022 $\mu$ F	1
364515	IC5	IC IR-2E01	1	364680	C58, 59	MYLAR 0.0047 $\mu$ F	2
		TRANSISTORS		364681	C73, 74	MYLAR 0.0056 $\mu$ F	2
364523	Q1	Tr. 3SK-45(B)	1	812156	C66, 79, 86, 89, 97, 101, 115, 117	MYLAR 0.01 $\mu$ F	8
364524	Q4	Tr. 2SK-55(D)	1	812164	C20, 57, 87, 88, 98, 110, 111, 120	MYLAR 0.022 $\mu$ F	8
364525	Q10, 11	Tr. 2SA-844(D)	2	364684	C31, 119	MYLAR 0.033 $\mu$ F	2
364526	Q5, 6, 7, 8, 9, 12, 13	Tr. 2SC-458(B)	7	265056	C63, 102	MYLAR 0.047 $\mu$ F	2
364527	Q14, 15, 50, 17	Tr. 2SC-460(B)	4				
364528	Q3	Tr. 2SC-461(B)	1	364699		LAPPING PIN W/BASE 2P	4
364529	Q2	Tr. 2SC-535(B)	1	364700		LAPPING PIN W/BASE 3P	3
		DIODES		364701		LAPPING PIN W/BASE 4P	2
364534	QD1, 2, 3, 4	1SV-55	4	364702		LAPPING PIN W/BASE 1P	7
364535	QD5, 6, 7, 8	1SV-100	4				
265024	D1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 14	1S-1555	13	265156		JUMPER LEAD 12.5 m/m	14
		COILS				RESISTORS	
812068	D13	1N-60	1	812088	R73, 74	RESISTOR 2/8W 22 $\Omega$ (PL)	2
364691	L2, 3, 4, 5	PEAKING COIL 2.2 $\mu$ H	4	364614	R5, 16, 91, 92, 106	RESISTOR 2/8W 100 $\Omega$ "	5
364692	L1	MICRO INDUCTOR 0.22 $\mu$ H	1	364615	R105	RESISTOR 2/8W 150 $\Omega$ "	1
364693	L6	MICRO INDUCTOR 0.47 $\mu$ H	1	364616	R7, 9, 20, 87, 109	RESISTOR 2/8W 330 $\Omega$ "	5
364694	L7, 8	MICRO INDUCTOR 10 $\mu$ H	2	812081	R17	RESISTOR 2/8W 1K $\Omega$ "	1
364695	F5, 6	38 KHZ FILTER F-38	2	812078	R111, 112	RESISTOR 2/8W 10K $\Omega$ "	2
364696	F1, 2, 4	10.7 KHZ FILTER FA-02	3	364619	R37, 39	RESISTOR 2/8W 12K $\Omega$ "	2
364697	RY-1	RELAY URT-103	1	812072	R6, 8, 10, 21, 93, 94	RESISTOR 2/8W 100K $\Omega$ "	6
265173		7P DIN SOCKET	2	364621	R88, 89	RESISTOR 2/8W 470K $\Omega$ "	2
364686	C4	TRIMMER CERAMIC 10PF	1				
364687	C5, 8	TRIMMER CERAMIC 50PF	2	364622	R2	RESISTOR 2/8W 47 $\Omega$ (F)	1
364688	C1	TRIMMER FILM 5PF	1	364623	R25	RESISTOR 2/8W 56 $\Omega$ "	1
364689	C2, 3	TRIMMER FILM 8PF	2	364624	R15, 77, 80, 104, 119, 120, 121, 122, 123, 133, 136	RESISTOR 2/8W 100 $\Omega$ "	11
364690	C6, 7	TRIMMER FILM 15PF	2	364625	R115, 117, 137	RESISTOR 2/8W 220 $\Omega$ "	3
		COILS		364626	R28, 34	RESISTOR 2/8W 330 $\Omega$ "	2
364545	T1	COIL CRF-9F021	1	364627	R102	RESISTOR 2/8W 470 $\Omega$ "	1
364546	T6	COIL 3A6	1	364628	R75	RESISTOR 2/8W 560 $\Omega$ "	1
364547	T8	COIL 225H01	1	364629	R26	RESISTOR 2/8W 680 $\Omega$ "	1
364548	T13	COIL S-103-185	1	364630	R19, 38, 54, 58, 59, 60, 82, 86, 90, 110, 128, 134	RESISTOR 2/8W 1K $\Omega$ "	12
364549	T2	COIL S-103-186	1	364631	R13, 46, 65, 66, 107	RESISTOR 2/8W 1.5K $\Omega$ "	5
364550	T3	COIL S-103-187	1	364632	R135	RESISTOR 2/8W 1.8K $\Omega$ "	1
364551	T4	COIL S-103-188	1	364633	R24, 41, 42, 67, 68, 85	RESISTOR 2/8W 2.2K $\Omega$ "	6
364552	T10	COIL S-103-189	1	364634	R52	RESISTOR 2/8W 3.3K $\Omega$ "	1
364553	T9	COIL S-103-191	1	364635	R11, 47, 118, 130, 131	RESISTOR 2/8W 4.7K $\Omega$ "	5
364554	T5, 7	COIL 55T-314	2	364636	R18, 55, 97, 98, 108, 114	RESISTOR 2/8W 5.6K $\Omega$ "	6
364555	T12	COIL S-103-193	1	364637	R61	RESISTOR 2/8W 6.8K $\Omega$ "	1
364556	T11	COIL S-103-194	1	364638	R44, 103	RESISTOR 2/8W 8.2K $\Omega$ "	2
265182	VR4, 8	SEMI-FIXED RESISTOR 5K $\Omega$ (B)	2	364639	R23, 49, 53, 76	RESISTOR 2/8W 10K $\Omega$ "	2
812240	VR2, 7	SEMI-FIXED RESISTOR 10K $\Omega$ (B)	2	364640	R22, 51	RESISTOR 2/8W 12K $\Omega$ "	4
364609	VR1	SEMI-FIXED RESISTOR 20K $\Omega$ (B)	1	364641	R125	RESISTOR 2/8W 15K $\Omega$ "	1
812214	VR6	SEMI-FIXED RESISTOR 50K $\Omega$ (B)	1	364642	R40, 83, 84, 127	RESISTOR 2/8W 18K $\Omega$ "	4
812213	VR5	SEMI-FIXED RESISTOR 100K $\Omega$ (B)	1	364643	R12, 95, 96, 124	RESISTOR 2/8W 22K $\Omega$ "	4
364612	VR3	SEMI-FIXED RESISTOR 500K $\Omega$ (B)	1	364644	R43, 45, 115	RESISTOR 2/8W 27K $\Omega$ (F)	3
		CAPACITORS		364645	R57	RESISTOR 2/8W 33K $\Omega$ "	1
364558	C21, 135	CAPACITOR (GLASS) 0.47PF	2	364646	R48, 50, 101, 129	RESISTOR 2/8W 47K $\Omega$ "	4
364559	C100	STYROL 220PF(J)	1				
364560	C99	STYROL 470PF(J)	1	364647	R1, 3, 27, 36, 71, 72, 81, 113, 126	RESISTOR 2/8W 100K $\Omega$ "	9
260076	C71	STYROL 820PF(J)	1	364648	R56, 62	RESISTOR 2/8W 220K $\Omega$ "	2
364562	C65, 67	TANTAL 0.33 $\mu$ F	2	364649	R99, 100	RESISTOR 2/8W 330K $\Omega$ "	2
260107	C68	TANTAL 0.47 $\mu$ F	1	364650	R35	RESISTOR 2/8W 470K $\Omega$ "	2
260106	C69, 131	TANTAL 3.3 $\mu$ F	2	364651	R4, 132	RESISTOR 2/8W 1M $\Omega$ "	2
364565	C9	NPO 2PF	1	364652	R138	RESISTOR 2/8W 10 $\Omega$ "	1
364566	C1, 22, 26	NPO 5PF	3	364653	R63, 64, 69, 70	RESISTOR 2/8W 3.9K $\Omega$ "	4
364567	C2, 7, 8, 23	NPO 1PF	4	364654	R78	RESISTOR 2/8W 150K $\Omega$ "	1
364568	C27	NPO 10PF	1				
364569	C10, 24	NPO 15PF	2	364704		SHIELD PLATE	1
260058	C103	NPO 30PF	1	364705		SOCKET 5P	1
364571	C104	NPO 51PF	1				
364572	C3	NPO 82PF	1	364503		PCB CPT-80H061	1
265068	C4, 80	CERAMIC 100PF	2	260138		PCB MOUNTING BRACKET (B)	3
364574	C11, 16, 17, 18, 19, 113, 116	CERAMIC 0.001 $\mu$ F	7			ICs	
364575	C28, 108	CERAMIC 0.01 $\mu$ F	2	364516	IC404	IC TC-4511 BP	1
364576	C5, 6, 12, 13, 15, 25, 29, 32, 33, 34, 37, 38, 39, 40, 41, 44, 46, 48, 49, 51, 52, 82, 83, 84, 85, 90, 93, 94, 95, 96, 105, 106, 107, 113, 114, 118, 121, 128	CERAMIC 0.02 $\mu$ F	38	364517	IC403	IC TD-6230IP	1
364577	C30, 50, 136	ELECT. 50V. 0.47 $\mu$ F	3	364518	IC401	IC TC-9125 BP	1
364578	C45, 56, 62, 72, 77, 78,,123, 124, 133, 137	ELECT. 50V. 1 $\mu$ F	10	364519	IC405	IC TD-6102P	1
364579	C129	ELECT. 50V. 3.3 $\mu$ F	1	364520	IC402	IC TC-9129P	1
364580	C60, 91, 92, 122, 125, 130	ELECT. 50V. 4.7 $\mu$ F	6			TRANSISTORS	
				364530	Q403, 404, 405, 406, 407, 408, 410, 412, 409, 413, 415, 416, 418	Tr. 2SC-458(B)	13
				364531	Q411, 414, 417	Tr. 2SD-468(B)	3
				364532	Q401	Tr. 2SC-461(B)	1
				265014	Q402	Tr. 2SK-30A (O or Y)	1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
<b>DIODES</b>							
364536	D401, 402, 403, 404, 406, 407, 408	DIODE 1S-1588	19	364663	R419 R429	RESISTOR 2/8W 5.6K $\Omega$ "	1
	409, 410, 412, 413, 416, 418, 419			364664	R403	RESISTOR 2/8W 6.8K $\Omega$ "	1
	420, 421, 422, 424			364665	R426, 432, 435	RESISTOR 2/8W 10K $\Omega$ "	3
265023	D414, 415	DIODE S-5277 or WO-3C	2	364592	R448	RESISTOR 2/8W 56 $\Omega$ "	1
260104	D417	ZENOR 05Z-5.1	1	364666	R414	RESISTOR 2/8W 15K $\Omega$ "	1
364707	X401	CRISTAL 9.00 MHZ	1	364667	R410, 411	RESISTOR 2/8W 27K $\Omega$ "	2
364557	T401	COIL S-103-184	1	364668	R402	RESISTOR 2/8W 33K $\Omega$ "	1
364708	L402, 404	MICRO INDUCTOR 10 $\mu$ H	2	364669	R412, 425	RESISTOR 2/8W 56K $\Omega$ "	2
364709	C401	CERAMIC TRIMMER 30PF	1	364670	R404, 405, 406, 407, 408, 409, 416, 417, 418, 419, 420, 421, 422, 423, 424, 438, 439, 442, 443	RESISTOR 2/8W 100K $\Omega$ "	17
364586	C419, 420	STYROL 220PF	2	364590	R438, 439	RESISTOR 2/8W 68K $\Omega$ "	2
265062	C438, 439	MYLAR 0.018 $\mu$ F	2	364599	R427, 428, 430, 431, 433, 434	RESISTOR 2/8W 47K $\Omega$ "	6
<b>CAPACITORS</b>				364600	R490, 491, 494, 492, 493	RESISTOR 2/8W 10K $\Omega$ (PL)	5
265076	C413	CERAMIC 220PF	1	364505		PCB CPP-801014A	1
265067	C415, 416, 417, 422, 423, 424, 425, 434	CERAMIC 470PF	8	260138		PCB MOUNTING BRACKET (B)	4
812174	C407, 412	CERAMIC 0.001 $\mu$ F	1	265153		LAPPING PIN	2
364591	C401	CERAMIC 0.0047 $\mu$ F	1	364717		LAPPING PIN W/BASE 9P	1
265074	C402, 404, 405, 406, 408, 427, 435, 436, 443	CERAMIC 0.01 $\mu$ F	9	364601	C301, 302, 303, 304, 307, 309, 311, 315	CERAMIC 50 WV 0.01 $\mu$ F	8
364593	C414	CAPACITOR 0.02 $\mu$ F	1	364603	C305	CERAMIC 35 WV 2200 $\mu$ F	1
364594	C410, 411	CAPACITOR NPO 39PF	2	364604	C306, 308, 310	CERAMIC 25 WV 470 $\mu$ F	5
364595	C442	CAPACITOR TANTAL 0.22 $\mu$ F	1	364605	C314	CERAMIC 10 WV 470 $\mu$ F	1
364596	C428 C418	ELECT. 0.47 $\mu$ F	1	364634	R304	RESISTOR 2/8W 3.3K $\Omega$	1
364597	C421, 428, 430, 432	ELECT. 1 $\mu$ F	4	364674	R305	RESISTOR 1W 47 $\Omega$	1
364598	C429, 431, 433	ELECT. 4.7 $\mu$ F	3	364675	R301	RESISTOR 2W 10 $\Omega$	1
265046	C403, 426	ELECT. 35V 10 $\mu$ F	2	364676	R302, 303	RESISTOR 2W 11 $\Omega$	2
265038	C409, 440, 441	ELECT. 10V 100 $\mu$ F	3	364538	D301	DIODE W-02	1
364601	C437	ELECT. 10V 470 $\mu$ F	1	364521	Q302	IC HA-17807	1
265156		JUMPER LEAD 12.5 mm	17	364522	Q301	IC HA-17815 (HA-17818)	1
265153		LAPPING PIN		265156		JUMPER LEAD 12.5 mm	2
364712		SHIELD	1	364507		PCB CPT-80E060	1
364713		SOCKET 4P	4	265156		JUMPER LEAD 12.5 mm	17
364714		SOCKET 5P	6	364639	D101-D109	DIODE TLR-124	9
<b>RESISTORS</b>				364723	S101-S114	TACT SWITCH	14
364655	R436	RESISTOR 2/8W 12 $\Omega$ (PL)	1	364508		PCB CPT-80E059-1	1
364656	R446, 447	RESISTOR 2/8W 39 $\Omega$ "	2	364509		PCB CPT-80E059-2	1
364657	R437	RESISTOR 2/8W 15 $\Omega$ (F)	1	364510		PCB CPT-80E059-3	1
364658	R444	RESISTOR 2/8W 10 $\Omega$ "	1	364677	R201	RESISTOR 2/8W 47 $\Omega$	1
364659	R413	RESISTOR 2/8W 680 $\Omega$ "	1	364540	D201-D204	DIODE GL-9PR2	4
364660	R415	RESISTOR 2/8W 1K $\Omega$ "	1	364541	D205-D209	DIODE GL-9NG2	5
364661	R401	RESISTOR 2/8W 2.2K $\Omega$ "	1	364542	D210-D214	DIODE GL-8N03D	5
364662	R440, 441	RESISTOR 2/8W 4.7K $\Omega$ "	2				

## EXPLODED VIEW PARTS

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
364726	1	FRONT PANEL	1	364503	33	P.C.B., CPT-80H061	1
364727	2	CHASSIS FRAME	1	364505	34	P.C.B., CPP-801014-B	1
364728	3	REAR PANEL	1	364508	35	P.C.B., CPT-80E059-1	1
364729	4	COVER, BOTTOM	1	364509	36	P.C.B., CPT-80E059-2	1
265215	5	DISPLAY, PLATE	1	364510	37	P.C.B., CPT-80E059-3	1
265216	6	ACRYL, DISPLAY	1	364501	38	P.C.B., CPT-80H062	1
265210	7	LED DISPLAY CASE	1	364754	39	CORD TERMINAL	1
265226	8	ACRYL, PANEL	1	364755	40	POWER XFORMER	1
265211	9	FOOT No. 7102	4	364756	41	PUSH SW SUF32A62	1
265224	10	PUSH KNOB (T,L) (G)	2	265185	42	POWER SW SDS-3P	1
265221	11	PUSH KNOB (P,L) (B)	1	364698	43	DIN JACK 7P	2
265223	12	PUSH KNOB (T,M) (F)	3	364758	44	ANTENNA TERMINAL	1
265222	13	PUSH KNOB (T,S) (E)	9	364759	45	BAR ANTENNA	1
265220	14	PUSH KNOB (P,S) (A)	3	364760	46	BATTERY CASE	1
260138	15	BRACKET, P.C.B.	10	364761	47	RCA PIN PLUG	1
265206	16	BRACKET, POWER SW	1	265188	48	AC CORD	1
364742	17	INSULATION, CORD TERMINAL	1	<b>MISCELLANEOUS</b>			
364704	18	SHIELD PLATE	1	364765		EARTH LUG 3 $\phi$	1
265207	19	BRACKET, DIN JACK	1	265195		TUBE 1.0 $\phi$ 8mm	2
364744	20	HEAT SINK	1	364767		UL TUBE 3.2 $\phi$ 40mm	2
364745	21	BRACKET, BATTERY CASE	1	364768		BATTERY UM-3X3	1
364746	22	COVER, BATTERY CASE	1	364769		FM ANTENNA	1
265230	23	SHAFT, POWER SW	1	364770		GIFT BOX	1
265237	24	STOPPER, SHAFT	1	364771		INSTRUCTION MANUAL	1
265217	25	BONNET	1	265199		TENSAI CERTIFICATE	1
265219	26	LED GUIDE	1	265197		POLY BAG	1
364751	27	RIBBON	1	265200		SNOW BOX	2
364753	28	DECORATION SCREW	2	812775		FUSE LABEL	1
265189	29	STOPPER, AC CORD	1	265193		BINDER LEAD	20
364501	30	P.C.B., CPT-80H062	1	364744		RIBBON	1
364507	31	P.C.B., CPT-80E060	1				
364763	32	FUSE 250V 800mA	1				

## 5-1 SPECIFICATIONS

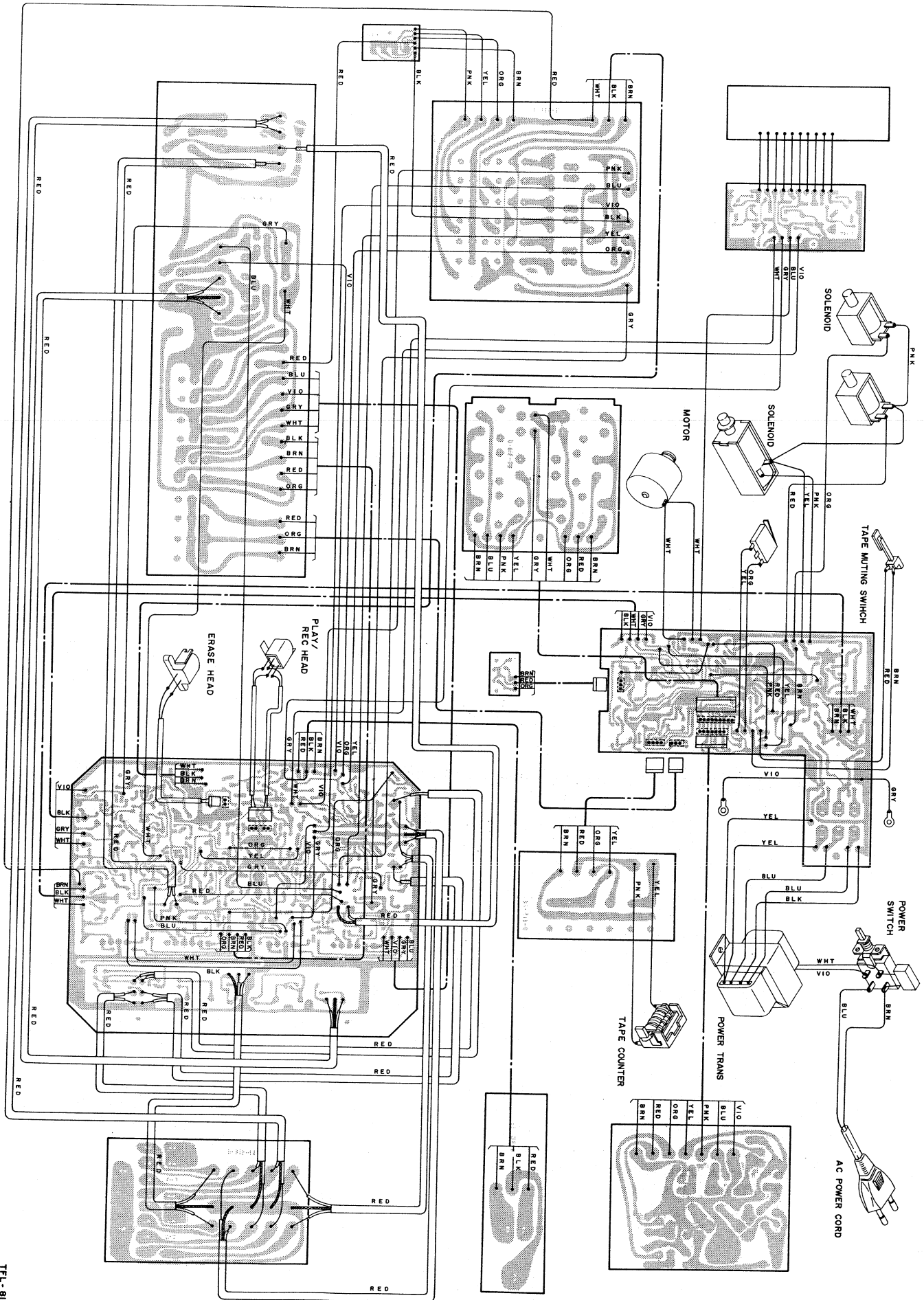
Tape System:	4-track, 2-channel Stereo System
Tape Speed:	1-7/8 ips (4.75 cm/s)
Frequency Response (REC/Playback):	20 Hz — 16,000 Hz
S/N Improvement by HIGH COM NR:	20 dB
S/N Ratio (REC/Playback):	50 dB
Wow & Flutter (Playback, JIS):	0.06%
Record Bias Frequency:	approx. 100 kHz
Distortion (REC/Playback):	1.0%
Cross Talk:	
between channel:	45 dB
between track:	65 dB
Input Sensitivity & Impedance	
Line Input:	70 mV, 100 k $\Omega$
Mic Input:	-70 dBm, 10 k $\Omega$
DIN Input:	-70 dBm, 3.3 k $\Omega$
Output Level & Load Impedance	
Line Output:	580 mV, 4.7 k $\Omega$
Headphone Output:	0.25 mW, 8 $\Omega$
Erase Effect (Chrome):	70 dB
Power Consumption:	18W
Weight:	7.0 kg
Dimension (WHD):	430 × 105 × 250 mm

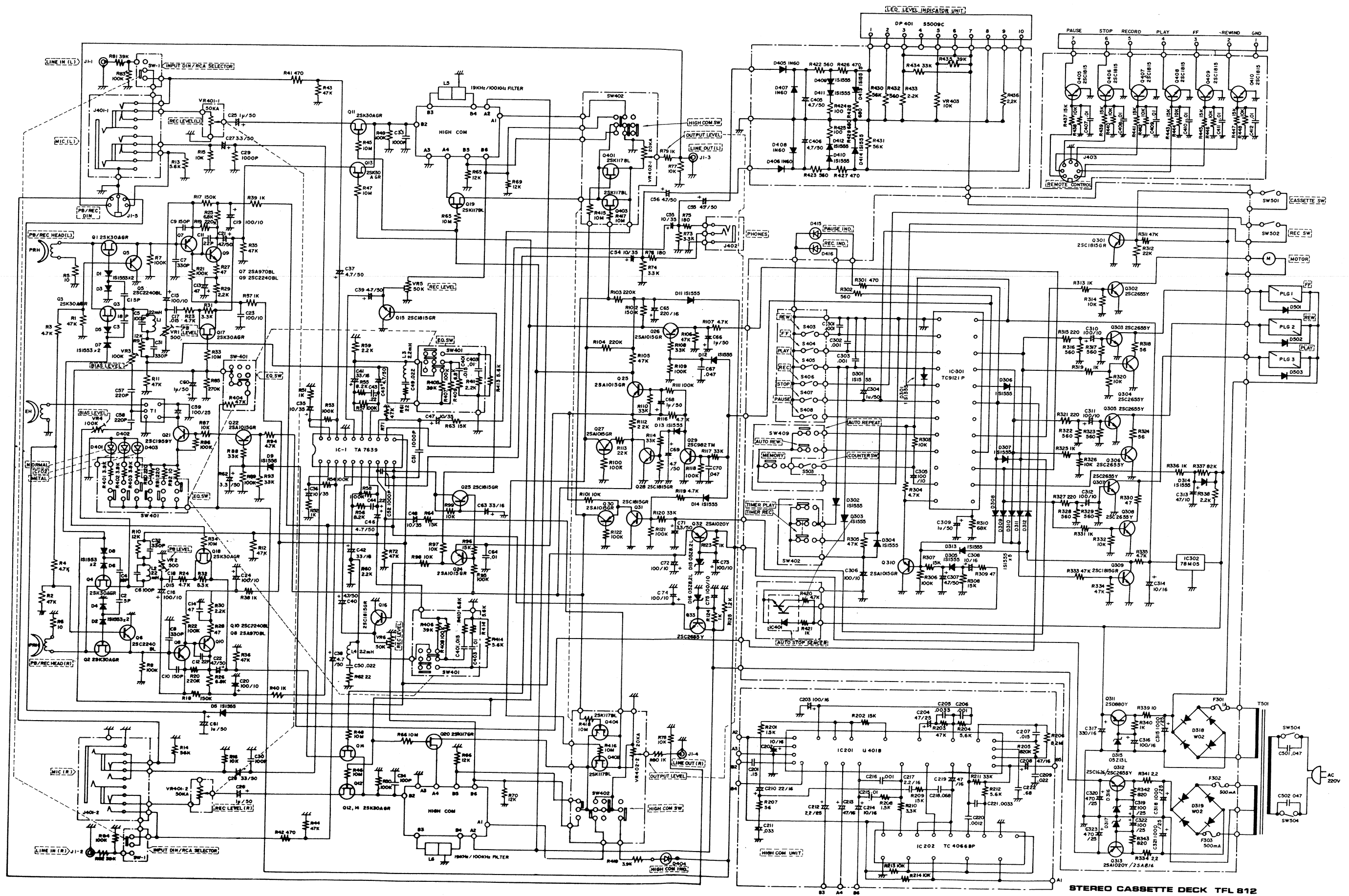
Our policy is one of continuous development of our products and we may change specifications without notice.

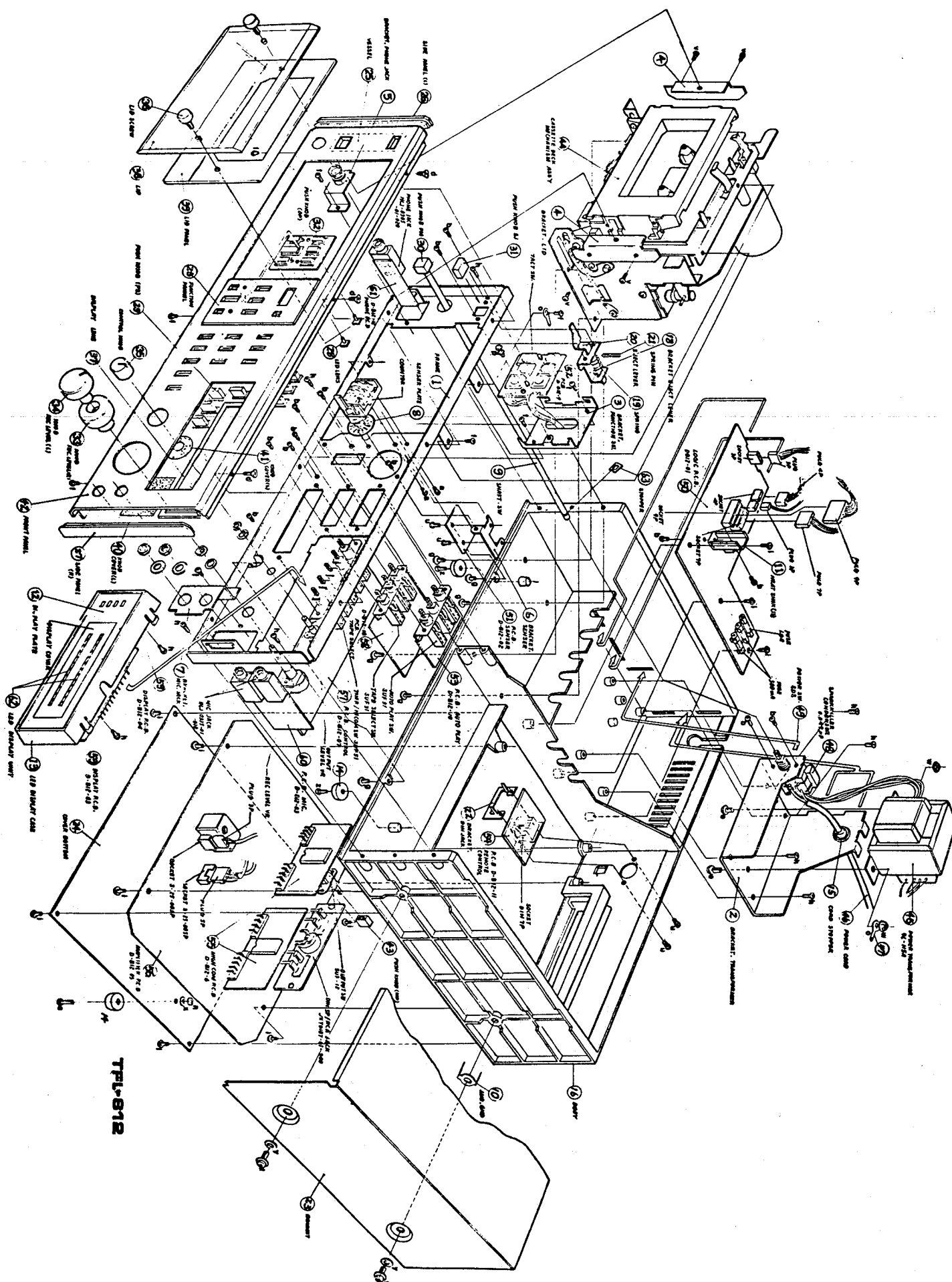
## 5-2 ALIGNMENT

### TFL-812 CASSETTE DECK ALIGNMENT PROCEDURES

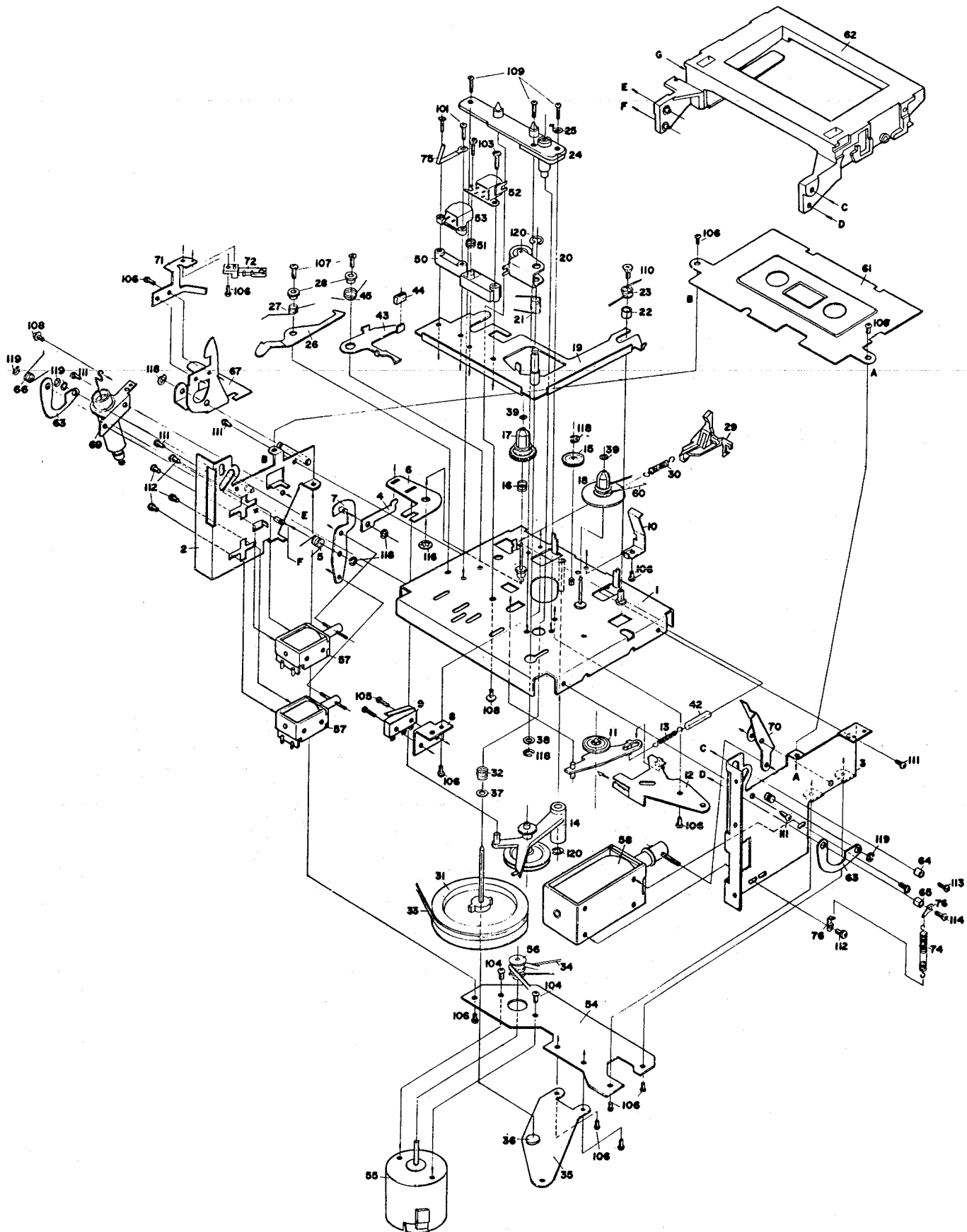
- 1) Adjustment of playback level**  
Adjust VR1 (L) and VR2 (R) so that the output may become 600 mV. Use DOLBY test tape, 200 mW/b. The position of VR402 should be at its maximum.
- 2) Adjustment of meter level**  
Adjust the meter level by VR401 so that the output from LINE OUT may become 420 mV when the signal is added the LINE IN, adjust the level by VR403 of the level meter so that 0 dB on the LED meter indicator may be lit up. The methods of the adjustment of the left and the right side of meter are the same. Then, check each level by rotating VR402.
- 3) Adjustment of leakage of bias**  
With cassette switches at recording condition, adjust L1 (L) and L2 (R) so that the voltage of TP3 (L) and TP4 (R) may become minimum. Use volt meter for adjustment.
- 4) Adjustment of recording level**  
Set the VR3 (L) and VR4 (R) at any position. With cassette switch at recording condition, apply approximately 1000 HZ 100 mV to LINE IN. Then adjust the level to the voltage of LINE OUT by VR401 (L, R). Start recording or playback after the adjustment of VR5 (L) and VR6 (R) so that the output of the LINE OUT has the same voltage at the record and play modes. Check each tape by the same procedure.
- 5) Adjustment of bias**  
With the cassette switch at recording condition, adjust VR401 (L, R) so that the motor output may become -20 dB at 420 mV, and repeat recording and playback so that of the figures of the frequency response should be within specifications. Measure the distortion by 0 dB VU level.
- 6) Bias frequency**  
The bias frequency should be within 100 KHZ plus/minus 10 %.  
Adjust TP3 on TP4 by T1 and measure the value.

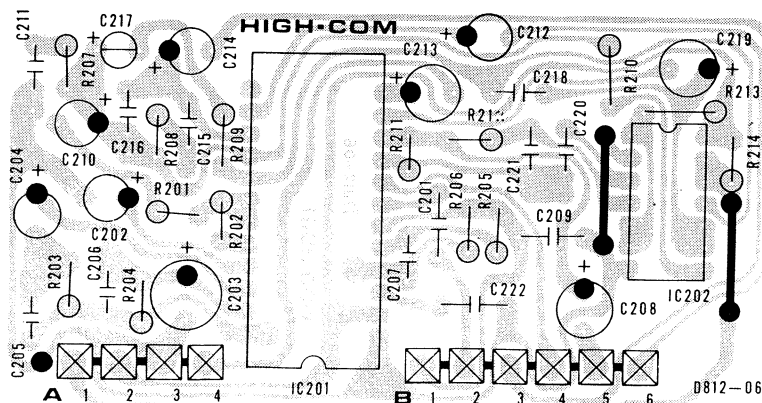
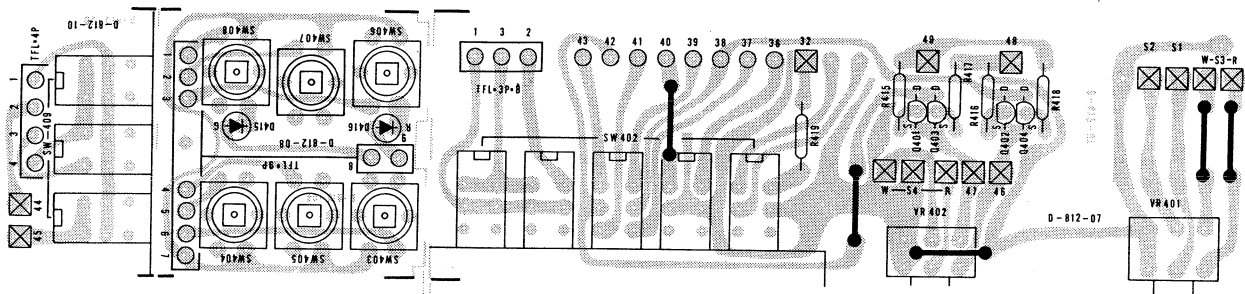
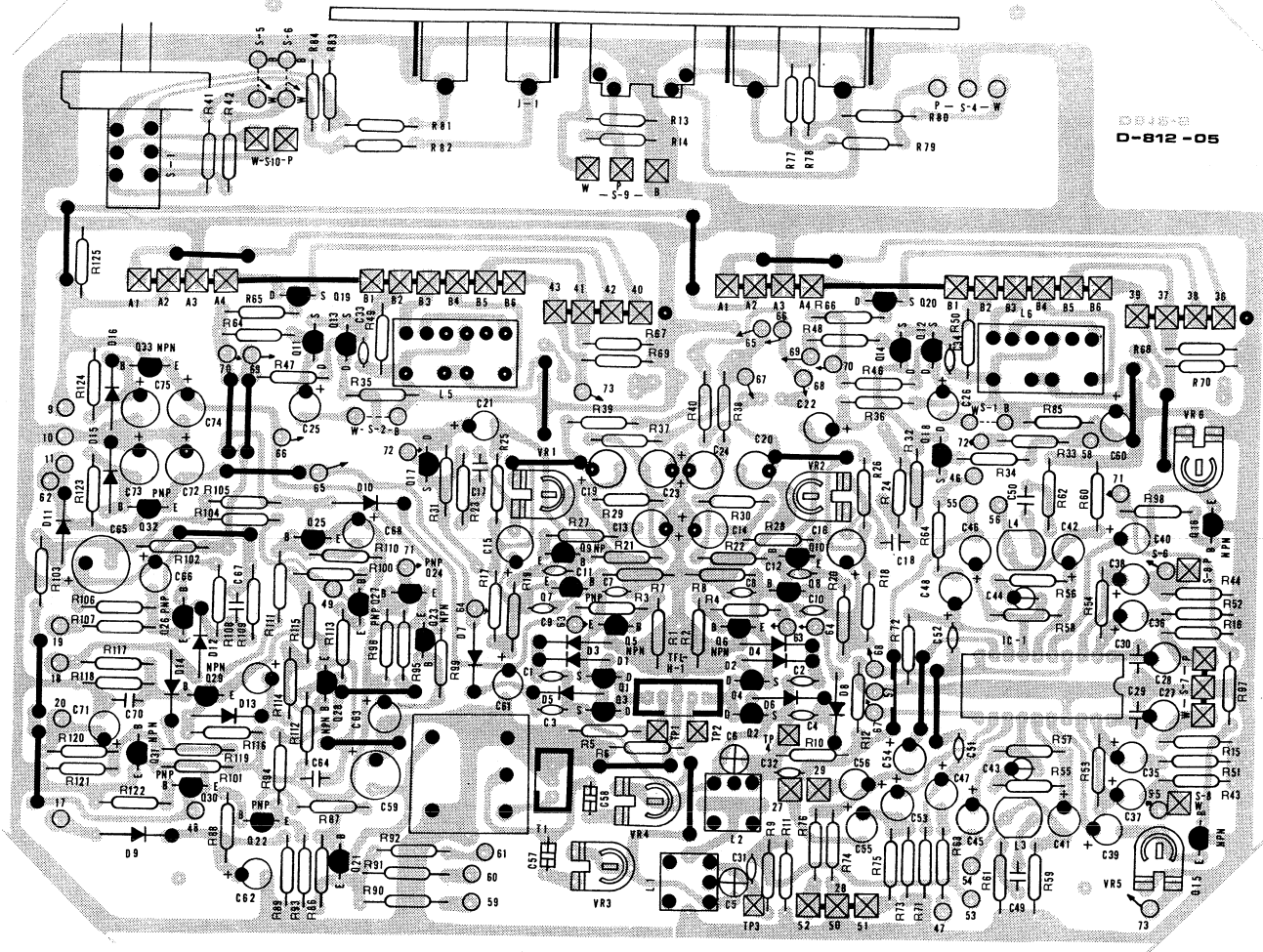




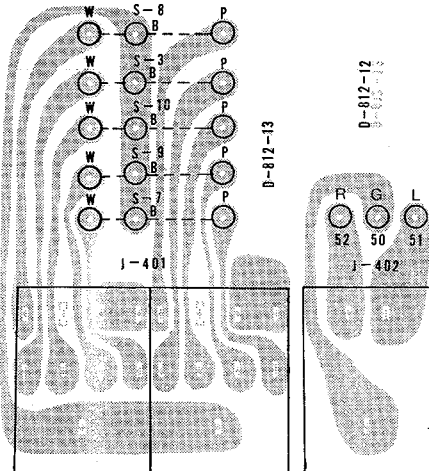
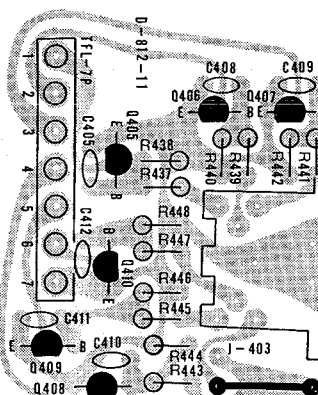
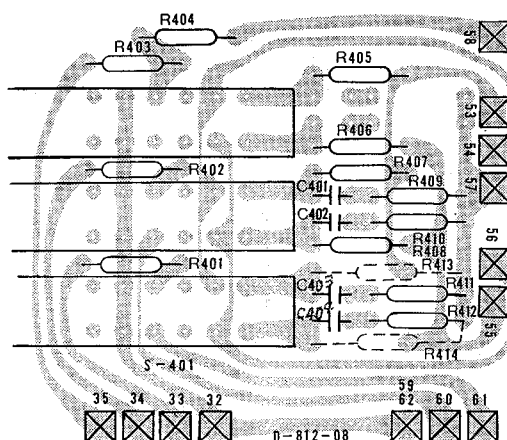
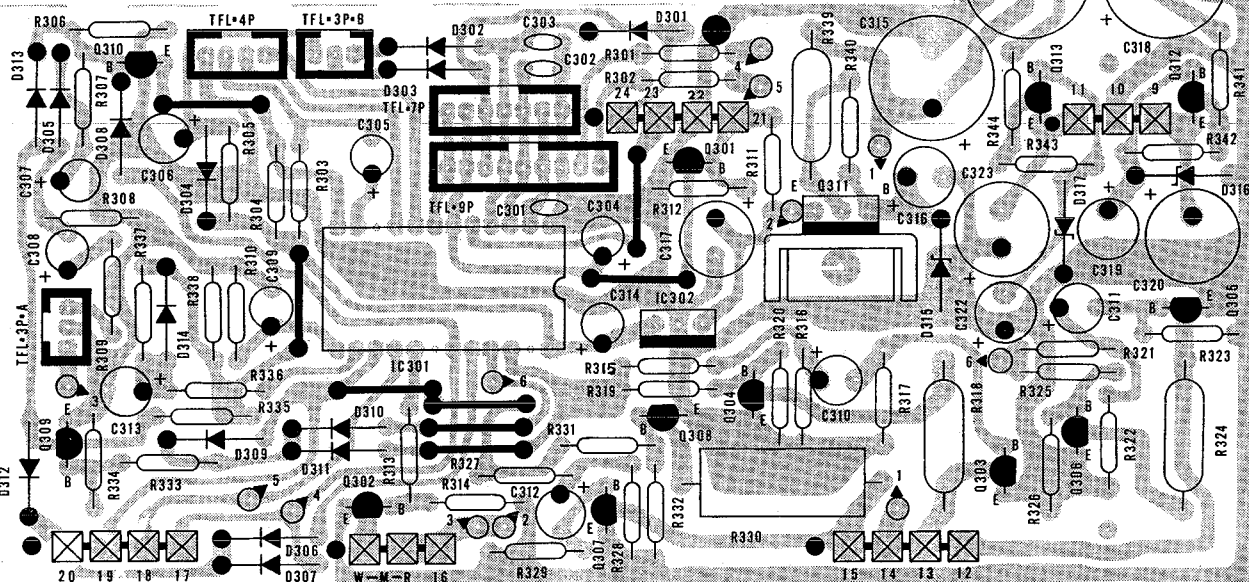
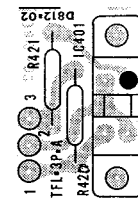
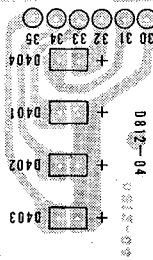
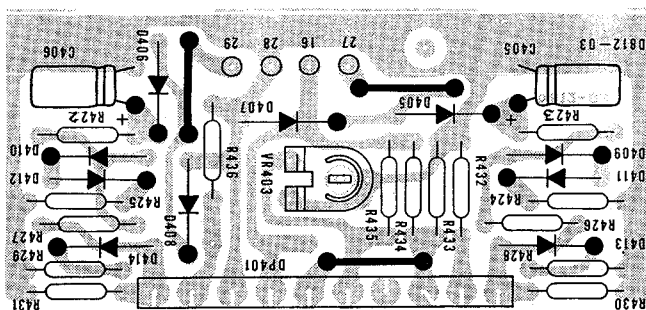








0812-01



PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
<b>POWER SECTION</b>				<b>REMOTE CONTROL SECTION</b>			
812165	T501, 9L-115A	POWER TRANSFORMER	1	812005		PCB D-812-11	1
265185	SW504	POWER SWITCH SDS-3P	1	265173	J403	DIN SOCKET TCS 4670-01-111	1
265189		CORD STOPPER 4K4	1	812052	Q405, 406, 407, 408, 409, 410	TR 2SC 1815 (GR)	6
265180	C501, 502	SPARKKILLER 0.047 $\mu$ F 250V	2	265074	C407, 408, 409, 410, 411, 412	CERAMIC 0.01 $\mu$ F 50V	6
265188		POWER CORD	1	812091	R437, 439, 441, 443, 445, 447	RESISTOR 15K $\Omega$ 2/8W	6
812170		LUG 4 $\phi$	1	812092	R438, 440, 442, 444, 446, 448	RESISTOR 10K $\Omega$ 2/8W	6
<b>LOGIC SECTION</b>				812195		CONNECTOR LEAD TFL-7P	1
812171		PCB D-812-01	1	265156		JUMPER LEAD 12.5 mm	2
812172	IC301	IC TC9121P	1	812093		RESISTOR 22 $\Omega$	1
265011	Q311	TR 2SD 880 (Y)	1	<b>HIGH-COM SECTION</b>			
812047	Q302, 303, 304, 305, 306, 307, 308	TR 2SC 2655 (Y)	1	812006		PCB D-812-6	2
812048	Q312	TR 2SC 1626 (Y)	1	812197	IC201	IC U401B	2
812050	Q301, 309	TR 2SC 1815 (GR)	2	812198	IC202	IC TC 40668P	2
812173	IC302	78M05	1	<b>CAPACITORS</b>			
812061	D318, 319	DIODE W02 8005	2	812013	C203	ELECT. CAPACITOR 100 $\mu$ F 16V	2
265024	D301, 302, 303, 304, 305, 312, 313, 314, 306, 307, 308, 309, 310, 311	DIODE 1S1555	14	812014	C208, C213, 219	ELECT. CAPACITOR 47 $\mu$ F 16V	6
812063	D316, 317	ZENOR DIODE 05Z-15U	2	812015	C210	ELECT. CAPACITOR 22 $\mu$ F 16V	2
265032	D315	ZENOR DIODE 05Z-13L	1	812016	C202, C214	ELECT. CAPACITOR 10 $\mu$ F 16V	4
<b>CAPACITORS</b>				812017	C204	ELECT. CAPACITOR 4.7 $\mu$ F 25V	2
812028	C315, 318, C321	CAPACITOR ELECT. 1000 $\mu$ F 25V	3	812018	C212	ELECT. CAPACITOR 2.2 $\mu$ F 25V	2
812029	C320, 323	CAPACITOR ELECT. 470 $\mu$ F 25V	2		C217	TANTAL 2.2 $\mu$ F 16V	2
812030	C317	CAPACITOR ELECT. 330 $\mu$ F 16V	1	812153	C206, 216	MYLAR 0.001 $\mu$ F 50V	4
812031	C319, 322	CAPACITOR ELECT. 100 $\mu$ F 25V	2	812154	C220	MYLAR 0.0012 $\mu$ F 50V	2
265037	C316	CAPACITOR ELECT. 100 $\mu$ F 16V	1	812155	C205, 221	MYLAR 0.0033 $\mu$ F 50V	4
265038	C305, 306, 310, 311, 312	CAPACITOR ELECT. 100 $\mu$ F 10V	5	812156	C215	MYLAR 0.01 $\mu$ F	2
812034	C313	CAPACITOR ELECT. 47 $\mu$ F 10V	1	812157	C207	MYLAR 0.015 $\mu$ F	2
812035	C308, 314	CAPACITOR ELECT. 10 $\mu$ F 16V	2	812158	C211	MYLAR 0.033 $\mu$ F	2
265044	C307	CAPACITOR ELECT. 4.7 $\mu$ F 50V	1	812159	C218	MYLAR 0.068 $\mu$ F	2
265042	C304, 309	CAPACITOR ELECT. 1 $\mu$ F 50V	2	812199	C201	MKH CAPACITOR 0.15 $\mu$ F 100V	2
812174	C301, 302, 303	CERAMIC 0.001 $\mu$ F 50V	3	812200	C209	MKH CAPACITOR 0.22 $\mu$ F 100V	2
<b>RESISTORS</b>				812201	C222	MKH CAPACITOR 0.68 $\mu$ F 100V	
812070	R330	RESISTOR 47 $\Omega$ 5W	1	<b>RESISTORS</b>			
812071	R318, 324	" 56 $\Omega$ 2W	2	812094	R201, 208	1.5K $\Omega$ $\pm$ 2%	4
812072	R306	" 100K $\Omega$ 2/8W(PL)	1	812095	R210	3.3K $\Omega$ $\pm$ 2%	2
812073	R337	" 82K $\Omega$ 2/8W(PL)	1	812096	R207	56 $\Omega$ $\pm$ 5%	2
812074	R310	" 68K $\Omega$ 2/8W(PL)	1	812097	R213, 214	10K $\Omega$ $\pm$ 5%	4
812075	R305, 311, 333, 334	" 47K $\Omega$ 2/8W(PL)	4	812098	R206	8.2M $\Omega$ $\pm$ 5%	2
812076	R312	" 22K $\Omega$ 2/8W(PL)	1	812099	R204, 212	5.6K $\Omega$ $\pm$ 2%	4
812077	R307, 308	" 15K $\Omega$ 2/8W(PL)	2	812100	R202, 209	15K $\Omega$ $\pm$ 2%	4
812078	R303, 314, 320, 326, 332	" 10K $\Omega$ 2/8W(PL)	5	812101	R211	33K $\Omega$ $\pm$ 2%	2
812079	R304, 335	" 47K $\Omega$ 2/8W(PL)	2	812102	R203	47K $\Omega$ $\pm$ 2%	2
812080	R338	" 2.2K $\Omega$ 2/8W(PL)	1	812103	R205	820K $\Omega$ $\pm$ 2%	2
812081	R313, 319, 325, 331, 336, 340	" 1K $\Omega$ 2/8W(PL)	6	812202		CONNECTOR 4P	2
812082	R342, 343	" 820 $\Omega$ 2/8W(PL)	2	812203		CONNECTOR 6P	2
812083	R302, 316, 317, 323, 328, 329, 322	" 560 $\Omega$ 2/8W(PL)	7	265156		JUMPER LEAD 12.5 mm	4
812084	R301	" 470 $\Omega$ 2/8W(PL)	1	<b>MAIN AMP SECTION</b>			
812085	R315, 321, 327	" 220 $\Omega$ 2/8W(PL)	3	812007		PCB D-812-05	1
812086	R309	" 47 $\Omega$ 2/8W(PL)	1	812205	IC-1	IC TA7639P	1
812087	R341, 344	" 22 $\Omega$ 2/8W(PL)	2	<b>TRANSISTORS</b>			
812088	R339	" 10 $\Omega$ 2W	1	265014	Q1, 2, 3, 4, 11, 12, 13, 14, 17, 18	FET 2SK 30A GR	10
265150		FUSE HOLDER 5 $\phi$	6	812207	Q19, 20	FET 2SK 117 (BL)	2
812151	F302, 203	FUSE 500mA F	2	812053	Q5, 6, 9, 10	TR 2SC 2240 (BL)	4
812152	F201	FUSE 1A F	1	812054	Q7, 8	TR 2SA 970 (BL)	2
812175		HEAT SINK (SMALL)	1	812055	Q15, 16, 23, 28, 31	TR 2SC 1815 (GR)	5
265195		TUBE 1 $\phi$ x 8 m/m	12	812056	Q22, 24, 25, 26, 27, 30	TR 2SA 1015 (GR)	6
812146		CONNECTOR SOCKET S-25-009P	1	812057	Q21	TR 2SC 1959 (GR)	1
812147		CONNECTOR SOCKET S-25-007P	1	812058	Q29	TR 2SC 982 TM	1
812148		CONNECTOR SOCKET S-25-004P	1	812059	Q33	TR 2SC 2665 Y	1
812149		CONNECTOR SOCKET S-25-003P	2	812060	A32	TR 2SA 1020 Y	1
812177		LAPPING PIN W/BASE (4 SERIES)	3	812066	D1, 2, 3, 4, 5, 6, 7, 8	DIODE 1S-1553	8
812178		LAPPING PIN W/BASE (3 SERIES)	2	265024	D9, 10, 11, 12, 13, 14	DIODE 1S-1555	6
265153		LAPPING PIN	6	812208	D15, 16	ZENOR 05Z-8.2L	2
265156		JUMPER LEAD 12.5 m/m	8	812209	T1	OSO BLOCK S103190	1
<b>MECHANISM SECTION</b>				812210	L5, 6	MPX FILTER FB2200A	2
265023	D501, 502, 503	MECHANISM ASSY FIT-20-10	1	812211	L1, 2	FILTER COIL 22mH 10 mm	2
812181		DIODE S5277	3	812212	L3, 4	MICROINDUCTOR 2.2 mH	2
812182		CONNECTOR LEAD FTL-H-1	1			RC875-222J	
812183		CONNECTOR LEAD FTL-H-2	1	812213	VR3, 4	SEMI FIXED RES. 100K $\Omega$	2
		LUG 3 $\phi$	1	812214	VR5, 6	SEMI FIXED RES. 50K $\Omega$	2
<b>AUTO SENSOR SECTION</b>				812215	VR1, 2	SEMI FIXED RES. 500 $\Omega$	2
812002		PCB D-812-02	1	812216	J1	JACK BOARD JXT0187-01-540	1
812184	IC-401	HOT CAPLER TLP-507A	1	812217			
812089	R420	RESISTOR 47K $\Omega$ 2/8W	1	812218		CONNECTOR SOCKET S-25-003P	1
812090	R421	RESISTOR 1K $\Omega$ 2/8W	1	812219		CONNECTOR SOCKET S-25-005P	1
812185		CONNECTOR LEAD TEL-3P	1	<b>CAPACITORS</b>			
<b>DECK SELECTOR SECTION</b>				812019	C65	ELECT. CAPACITOR 220 $\mu$ F 25V	1
812003		PCB D-812-9	1	812020	C59	" 100 $\mu$ F 25V	1
812186	SW403, 404, 405, 406, 407, 408	TACT SWITCH	6	265038	C15, 16, 19, 20, 23, 24, 72, 73, 74, 75	" 100 $\mu$ F 10V	10
265163	D416	LED TLR-124	1	265041	C13, 14	" 47 $\mu$ F 16V	2
812188	D415	LED TLG-124	1	265049	C63, 41, 42	" 33 $\mu$ F 16V	3
812189		CONNECTOR LEAD TFL-9P	1	265046	C35, 36, 47, 48, 53, 54	" 10 $\mu$ F 35V	6
<b>AUTO PLAY SECTION</b>				265044	C21, 22, 37, 38, 39, 40, 45, 46, 55, 56, 69	" 4.7 $\mu$ F 50V	11
812004		PCB D-812-10	1	265051	C27, 28, 62, 71	" 3.3 $\mu$ F 50V	4
812190	SW409	PUSH SWITCH SUF31 (3 SERIES)	1	265042	C25, 26, 60, 61, 66, 68	" 1 $\mu$ F 50V	6
265153		LAPPING PIN	2				
812192		CONNECTOR LEAD TFL-4P	1				

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
<b>RESISTORS</b>							
812104	R33, 34, 45, 46, 47, 48, 65, 66,	RESISTOR 10M $\Omega$ 2/8W	8	812224		LAPPING PIN W/BASE (4 SERIES)	2
812105	R85	RESISTOR 270K $\Omega$ 2/8W	1	812225		LAPPING PIN W/BASE (3 SERIES)	2
812106	R19, 20, 103, 104	RESISTOR 220K $\Omega$ 2/8W	4	812226		LAPPING PIN W/BASE (3 SERIES)	13
812107	R17, 18, 102	RESISTOR 150K $\Omega$ 2/8W	3	265156		JUMPER LEAD 12.5 m/m	22
812108	R7, 8, 21, 22, 49, 50, 53, 54, 57, 58, 83, 84, 86, 89, 95, 100, 109, 118, 121, 122	RESISTOR 100K $\Omega$ 2/8W	21	<b>SELECTOR SECTION</b>			
812109	R1, 2, 11, 12, 35, 36, 43, 44, 71, 72 105, 106, 115	RESISTOR 47K $\Omega$ 2/8W	13	812008		PCB D-812-07	1
812110	R81, 82	RESISTOR 39K $\Omega$ 2/8W	2	812228	S402	PUSH SWITCH SUF51	1
812111	R88, 93, 108, 110, 114, 117, 120	RESISTOR 33K $\Omega$ 2/8W	7	812229	VR401	VR 50KAX2	1
812112	R113	RESISTOR 22K $\Omega$ 2/8W	1	812230	VR402	VR 20KAX2	1
812113	R63, 64, 96	RESISTOR 15K $\Omega$ 2/8W	3	812231	Q401, 402, 403, 404	FET 2SK 117 (BL)	4
812114	R9, 10, 67, 68, 69, 70	" 12K $\Omega$ 2/8W	6	812231	R415, 416, 417, 418	RESISTOR 10M $\Omega$ 2/8W	4
812115	R15, 16, 77, 78, 87, 97, 98, 99 101	" 10K $\Omega$ 2/8W	9	812232	R419	RESISTOR 3.9K $\Omega$ 2/8W	1
812116	R25, 26	" 6.8K $\Omega$ 2/8W	2	812232		CONNECTOR LEAD TFL-3P	1
812117	R13, 14	" 5.6K $\Omega$ 2/8W	2	812233		JUMPER LEAD 12.5 m/m	4
812118	R3, 4, 23, 24, 94, 107, 116, 119	" 4.7K $\Omega$ 2/8W	8	265153		LAPPING PIN	13
812119	R31, 32, 73, 74	" 3.3K $\Omega$ 2/8W	4	<b>REC EQ SECTION</b>			
812120	R29, 30, 59, 60, 112	" 2.2K $\Omega$ 2/8W	5	812009		PCB D-812-08	1
812121	R37, 38, 39, 40, 51, 52, 79, 80, 123, 124	" 1K $\Omega$ 2/8W	10	S401		PUSH SWITCH SUF 31	1
812122	R41, 42	" 470 $\Omega$ 2/8W	2	812133	R405, 406	RESISTOR 39K $\Omega$ 2/8W	2
812123	R75, 76	" 180 $\Omega$ 2/8W	2	812134	R404	" 47K $\Omega$ 2/8W	1
812124	R27, 28	" 47 $\Omega$ 2/8W	2	812135	R407, 408	" 100K $\Omega$ 2/8W	2
812125	R61, 62	" 22 $\Omega$ 2/8W	2	812136	R401, 402, 403	" 29K $\Omega$ 2/8W	3
812126	R5, 6, 92	" 10 $\Omega$ 2/8W	3	812137	R413, 414	" 5.6K $\Omega$ 2/8W	2
812127	R125	" 1.2K $\Omega$ 2/8W	1	265153		LAPPING PIN	12
812128	R55, 56	" 8.2K $\Omega$ 2/8W	2	<b>LED DISPLAY SECTION</b>			
812129	R91	" 220 $\Omega$ 1/2W	1	812010		PCB D-812-03	1
812130	R90	" 220 $\Omega$ 1/2W	1			PCB D-812-04	1
<b>CAPACITORS</b>				265180	DP401	LED SET S-5009C	1
812160	C29, 30	MYLAR 0.001 $\mu$ F 50V	2	812068	D405, 406, 407, 408	DIODE 1N-60	4
812161	C64	" 0.01 $\mu$ F 50V	1	812069	D409, 410, 412, 413, 414	DIODE 1S-1555	6
812162	C17, 18	" 0.015 $\mu$ F 50V	2	265181	D401, 402, 403, 404	LED GL-9PR2	4
265060	C67, 70	" 0.047 $\mu$ F 50V	2	812239	C405, 406	ELECT. 4.7mF/50	2
812164	C49, 50	" 0.022 $\mu$ F 50V	2	812240	UR403	SEMI FIXED RES. 10K $\Omega$	1
812038	C11, 12	CERAMIC 22PF 50V	2	812138	R424, 425	RESISTOR 100 $\Omega$ 2/8W	2
265075	C33, 34	" 100PF 50V	2	812139	R426, 427	" 470 $\Omega$ 2/8W	2
812040	C9, 10	" 150PF 50V	2	812140	R422, 423, 432	" 560 $\Omega$ 2/8W	3
812041	C7, 8	" 330PF 50V	2	812141	R433, 436	" 2.2K $\Omega$ 2/8W	2
812042	C51, 52	" 0.001 $\mu$ F 50V	2	812142	R434	" 33K $\Omega$ 2/8W	1
812043	C31, 32	" 330PF 10% 100V	2	812143	R435	" 39K $\Omega$ 2/8W	1
812044	C3, 4	" 18PF 10% 100V	2	812144	R430, 431	" 56K $\Omega$	2
812045	C1, 2	" 5PF 10% 100V	2	812145	R428, 429	" 680 $\Omega$	2
812220	C5, 6	STYROL 100PF 125V	2	265156		JUMPER LEAD 12.5 m/m	3
812221	C43, 44	TANTAL 0.22 $\mu$ F 16V	2	<b>MIC SECTION</b>			
812222	C57, 58	MICA 220PF 500V	2	812011		PCB D-812-13	1
812223	S1	PUSH SWITCH <sup>2</sup> SUF12 (SINGLE)	1	812242	J401	MIC JACK HLJ0335-01-010	1
				<b>HEADPHONE SECTION</b>			
				812012		PCB D-812-12	1
				265176	J402	HP JACK HLJ0305-01-020	1

## EXPLODED VIEW PARTS

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
812254	1	FRONT FLAME	1	812284	31	PUSH KNOB (C)	1
812255	2	FLAME, POWER TRANSFORMER	1	812285	32	FUNCTION KNOBS	1
812256	3	FLAME, FUNCTION	1	812286	33	LEVEL KNOB (RIGHT)	1
812257	4	BRACKET, LID	2	812287	34	LEVEL KNOB (LEFT)	1
265208	5	HD FLAME (HEADPHONE)	1	265229	35	OUTPUT LEVEL KNOB	1
812259	6	BRACKET, SENSOR	1	812289	36	KNOB, LID	2
812260	7	MJ FLAME (MIC JACK)	1	265226	37	ACRYL, PANEL	1
812261	8	SENSOR PLATE	1	812291	38	ACRYL, LID	1
265230	9	SHAFT, POWER SW	1	812292	39	LID PANEL	1
812263	10	EARTH LUG	1	812293	40	KNOB COVER (L)	1
265209	11	HEAT SINK	1	812294	41	KNOB COVER (S)	1
265215	12	LED PLATE (DISPLAY)	1	812295	42	FRONT PANEL	1
265210	13	LED CASE (DISPLAY)	1	812296	43	PUSH KNOB (B), INPUT	1
				812298	44	MECHANISM ASS'Y	1
265211	14	FOOT No. 7102	3	812165	45	POWER XFORMER	1
265189	15	CORD STOPPER 4K-4	1	265188	46	AC POWER CORD	1
812270	16	CHASSIS FLAME	1	812170	47	LUG 4 $\phi$	1
265216	17	LED ACRYL	1	812168	48	SPARK KILLER 0.047 $\mu$ F	1
812272	18	BRACKET, EJECT SW	1	812166	49	POWER SW	1
812273	19	SPRING, EJECT SW	1	812171	50	PCB, D-812-01	1
812267	20	EJECT SW	1	812002	51	PCB, D-812-02	1
812297	21	SPRING PIN, EJECT SW	1	812003	52	PCB, D-812-09	1
265207	22	SOCKET MOUNTING BRACKET	1	812004	53	PCB, D-812-10	1
812275	23	BONNET	1	812005	54	PCB, D-812-11	1
812276	24	BOTTOM PLATE	1	812006	55	PCB, D-812-06	2
812277	25	FUNCTION PANEL	1	812007	56	PCB, D-812-05	1
812278	26	VESSEL	1	812008	57	PCB, D-812-07	1
812279	27	SASH SIDE (L)	1	812009	58	PCB, D-812-08	1
812280		SASH SIDE (R)	1	812010	59	PCB, D-812-03, 04	1
265219	28	LED GUIDE	2	812011	60	PCB, D-812-13	1
265220	29	PUSH KNOB (A)	11	812012	61	PCB, D-812-12	1
265221	30	PUSH KNOB (B)	1	812237	62	LED DISPLAY UNIT	1
				265237	63	STOPPER, SHAFT	1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
<b>MISCELLANEOUS</b>				812247		INDIVIDUAL CARTON BOX	1
265193		BINDER, LEAD	5	812248		SNOW BOX	1 SET
812244		EARTH LUG 3φ	1	812249		INSTRUCTION MANUAL	1
812245		LEAD WIRE	1 SET	265199		TENSAI CERTIFICATE	1
812246		SCREW	1 SET	812251		RATING LABEL	1
				812252		CONNECTION CABLE	1
				812253		POLY BAG	1

## MECHANISM PARTS

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY	PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
PBD 0566	1	CHASSIS ASS'Y	1	PBE 13936	60	BELT	1
PBD 0611	2	SIDE PLATE L ASS'Y	1	PBE 01196	61	BACK PLATE ASS'Y	1
PBD 0642	3	SIDE PLATE R ASS'Y	1	PBD 0638	62	LOADING CASE ASS'Y	1
PBE 14073	4	LINK PLATE B	1	PBE 14106	63	LINK	2
PBE 14084	5	SPRING	1	PBE 14121	64	COLLAR	1
PBE 14074	6	LINK PLATE C	1	PBE 13394	65	COLLAR	1
PBE 01190	7	LINK PLATE A ASS'Y	1	PBE 14089	66	SPRING	1
PBE 14092	8	SWITCH PLATE	1	PBE 14105	67	EJECT LEVER	1
AH 2522	9	MICRO SWITCH	1	PBE 14088	68	SPRING	1
PBE 13722	10	CASSETTE HOLDER	1	PBE 01374	69	CYLINDER ASS'Y	1
PBE 01055	11	IDLER ASS'Y	1	PBE 14070	70	LEVER	1
PBE 14108	12	IDLER PLATE	1	PBE 14195	71	SWITCH PLATE	1
PBE 14258	13	T SPRING	1	MSW 0094	72	LEAF SWITCH	1
PBD 0538	14	TENSION ASS'Y	1		73		
PBE 14337	15	IDLER GEAR	1	PBE 12929	74	T SPRING	1
PBE 13640	16	C SPRING	1	PBE 13261	75	LAG	1
PBE 01054	17	S REEL ASS'Y	1	PBE 13794	76	LAG	2
PBE 01129	18	T REEL ASS'Y	1	PBE 14271	77	CR. TUBE	1
PBD 0570	19	HEAD BASE ASS'Y	1	PGSN20A2015	101	B SCREW M2x15, head(2)	2
PBE 01191	20	PINCH ARM ASS'Y	1	PGSP20A2012	102	B SCREW M2x12	1
PBE 14081	21	PINCH ARM SPRING	1	PGSN20A2012	103	B SCREW M2x12, head(2)	2
PBE 14066	22	COLLAR	1	GSP10A2603	104	SCREW M2.6x3, Motor(2)	2
PBE 14082	23	SPRING	1	PGSP10A2010	105	SCREW M2x10, micro switch(2)	2
PBE 01192	24	SHAFT HOLDER ASS'Y	1				
PBE 13507	25	EARTH PLATE	1	PGSD10A2605	106	DT SCREW M2.6x5, FW(3) Motor(3) Idlerplate(1)cassette SW(3) Eackplate(2)	13
PBE 14107	26	INTER LEVER	1				
PBE 14090	27	SPRING	1	PGSD10A2606	107	DT SCREW M2.6x6 collar(2)	2
PBE 14067	28	COLLAR	2				
PBC 1077	29	INTER LOCK	1	PGST15A2606	108	F TAPPING SCREW holder(1)	1
PBE 14091	30	T SPRING	1				
PBD 1550	31	FLYWHEEL	1	PGSD10A2610	109	M2.6x8 cylinder(1)	2
PBE 13023	32	C SPRING	1				
PBE 14031	33	BELT	1	PGSD10A2610	109	DT SCREW M2.6x10 holder(3)	3
PBE 14032	34	BELT	1	PGSP30A2612	110	K SCREW M26x12 collar(1)	1
PBE 01441	35	FLYWHEEL HOLDER ASS'Y	1	PGSD10A3005	111	DT SCREW M3x5 side plate(4),cylinder(1)	5
				PGSP20A3004	112	B SCREW M3x4 SOLENOID(6)	6
PBE 13497	36	CAPSTAN SUPPORT	1	PGST10A3010	113	TAPPING SCREW, case(1) M3x10	1
PBE 13880	37	WASHER	1	PGST10A2610	114	TAPPING SCREW, case(1) M2.6x10	1
PGWF30A080050	38	WASHER	1	PGSS01A2003	115	SCREW M2x3, pulley(1)	1
PGWM16X040020	39	WAHER	2	PGRS30P	116	CS RING CS-3,link plate(1)	1
PGWF30A060050	40	WASHER	2		117		
	41			PGRE25A	118	E RING E-2.5 Link plate(2) Head(1)	5
PBE 14114	42	TUBE	1			EJECT lever(1)	4
PBE 14272	43	BRAKE PLATE	1	PGRE30A	119	E RING E-3,Link(4) lever	4
PBE 14180	44	BRAKE CR	1	PGRE40A	120	E RING E-4,Pinch arm(1) Tension(1)	2
PBE 6007	45	SPRING	1				
PBE 11077	50	HEAD STAND	1				
PBE 13666	51	C SPRING	1				
H2331	52	P/R HEAD	1				
H53201	53	ERASE HEAD	1				
PBD 14075	54	MOTOR BRACKET	1				
EG510ED2B	55	MOTOR	1				
PBE 14034	56	MOTOR PULLEY	1				
PBE 3883	57	SOLENOID	2				
PBE 2882	58	SOLENOID	1				
	59						

## ASSEMBLING HARDWARE CODING LIST

a — Pan Head Screw PAN M3x4  
 b — " PAN M3x6  
 c — " PAN M3x12  
 d — Binding screw M3x4  
 e — PAN HEAD SCREW M4x8 WITH FLAT WASHER  
 f — Binding Screw PAN 3x6  
 g — " PAN 3x8 WITH FLAT WASHER  
 h — " PAN 3x8  
 i — " PAN 3x8 WITH FLAT WASHER  
 j — " PAN 3x14  
 k — LOCK WASHER 3φ  
 m — WASHER 3φ x 6φ Black

n — NUT M3  
 p — Push RIVET  
 o — Lug 3φ  
 r — FLAT WASHER 3.5φ x 9φ  
 s — GROUND KNOB NUT  
 t — SCREW M4x8 WITH FLAT WASHER BLACK  
 u — SCREW M3x8  
 v — Binding Screw 2.6 x 6  
 w — LOCK NUT M4  
 x — FLAT WASHER 3φ  
 y — FLAT WASHER 4φ x 10φ BLACK  
 z — Binding Screw 3x10